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ABSTRACT

Games can be used to supplement the science program and are fun to use in the classroom to stimulate interest in scientific concepts. They provide students with the opportunity to use the knowledge they have learned in an active manner. Included in this booklet are 13 games for life sciences, 3 for physical science, 3 for earth/space science, and 4 for general science. These activities can be used with grades K-8 science lessons. Each includes grade level, purpose, number of players, materials, preparation, direction, and reproducible game pieces. (CW)

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ARE YOU GAME?

by Patty J. Horn

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Science Games in the Classroom

illustrated by Victoria J. Smith

SE 050 638

ARE YOU GAME?

As we go along life's road, special people touch our lives. In the past, those people have been my teachers. In the present, those people are my students.

Diane Anders
Belinda Cartwright
Cindy Granger
Patrice Green
Kris Van Hazel
Tamhra Kinsey
Debbie LeBrun
Karen Kleppe
Grace Kobojek
Melody Long
Alma Melton
Sheryl Ann New
Mary Beth Potter
Patricia Sutton
Brenda Van Ryn
Eugene Wilson

A special thanks to:
LaLana Adickes
Debra Howell
Victoria Smith

Thank you all for sharing the ideas that made this book a reality.

Patty J. Horn, Ed.D.
Grand Canyon College
Phoenix, Arizona

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PHOENIX, AZ

INTRODUCTION

Games can be used to supplement the science program and are a fun media to use in the classroom to stimulate interest in scientific concepts. They provide students with the opportunity to utilize the knowledge they have learned in an active manner.

The advantages of incorporating games in the classroom include the following:

* Games meet educational objectives. Games can provide reinforcement or enrichment for students.
* Games provide hands-on activities for students. The playing of games is a natural element in child development. The student has the opportunity to manipulate and utilize concrete examples of abstract concepts.
* Games provide a link between what is being taught and relevancy to the student's everyday life.
* Games provide immediate feedback for the correctness of a response.
* Games develop problem solving skills. Students gain factual information, see relationships, follow directions, compare and categorize information.

In the evaluation of a game for use in the classroom, the following questions should be resolved:

* Does the game comply with the objective?
* How many students can play the game at any one time?
* Does the game meet the time constraints imposed by the class periods?
* Can the limitations imposed by spatial needs be met?
* Are the directions adequate to meet the needs of the players?
* Is it fun?

Purchasers of Are You Game? have been granted permission to copy activity pages for classroom use.

HINTS TO THE TEACHER

Accuracy of Fact Cards: The facts utilized in the games are documented through the references in the bibliography. If a student disagrees with the answer on a fact card, he should have the opportunity to prove his answer through the use of reference books (see Hints to the Student).

Answer Key: If it is appropriate for the students to use the answer key as a reference, do not enclose the key in a separate envelope. If it is not appropriate for the students to refer to the answer key while playing the game, enclose the answer key in a separate envelope.

Appearance: Games can be made attractive by mounting the Xeroxed directions and answer keys on construction paper.

Cards: Varied colored index cards can be used as playing cards rather than poster board. The index cards are uniform in size and easier to shuffle.

Containers: Games should be put separately into boxes, cans, folders or envelopes. Select containers that are attractive and easy to store. Ziplock freezer bags can be used for storage of game pieces and/or directions. Attach the bag to the gameboard with a small ring.

Game Markers: The bakery supply shop provides unique small figures for use as game markers: i.e. space figures, animals, canned food, etc.

Glue: Use of a fabric glue or a super glue is more successful when putting pattern pieces together on a laminated surface or onto felt. If the gameboard is laminated before you glue objects onto it, use sandpaper to roughen the surface before using the glue. Use rubber cement with any paper patterns.

Grade Level: Most of the games can be adapted to meet the needs of the classroom by adjusting the directions and questions to the desired grade level. The specified grade levels stated are suggested levels only.

Patterns: Coloring books, sticker books, or discarded magazines found in the store or at yard sales are valuable resources for game patterns.

HINTS TO THE STUDENT

Answering Questions: Sometimes the student will use different words than the words given on the answer key. The group playing the game should discuss the differences and decide if the two answers have the same meaning.

Sometimes, the answer given by the student will be different from the answer on the answer key. If the student disagrees with the answer key, the student can prove his answer through the use of reference books.

Dealer of the Cards: Shuffle the cards and hand one to each player. Make sure everyone has the same number of cards.

REFERENCE DIRECTORY

	K	1	2	3	4	5	6	7	8
LIFE SCIENCE:									
TURTLE TRIVIA				X	X	X			
TRAVELING GROUPS			X	X	X	X			
SILLY SNAKES				X	X	X	X		
WATCH ME GROW		X	X	X					
WILL YOU SURVIVE?					X	X	X		
HABITATS - WHERE DO WE LIVE?			X	X	X	X	X		
HEART ATTACK							X	X	X
MR. BONES						X	X	X	X
HEART TO HEART					X	X	X	X	
LAND AND SEA				X	X	X			
CRAZY SKELETON					X	X	X		
GROWING A PLANT			X	X					
FUR OR FEATHERS		X	X	X					

	K	1	2	3	4	5	6	7	8
PHYSICAL SCIENCE:									
MAY THE MAGNETIC FORCE BE WITH YOU		X	X	X					
BRIGHT IDEAS					X	X	X		
CHEM CLIP							X	X	X
EARTH/SPACE SCIENCE:									
SOLAR SYSTEM SHUTTLE						X	X	X	X
SPACED OUT TIC TAC TOE							X	X	X
CLOUDS						X	X	X	X
GENERAL SCIENCE:									
THE ATTRIBUTE GAME			X	X	X	X	X		
SHADOWS	X	X	X	X					
FOODOPOLY				X	X	X	X		
DESERT ADVENTURE					X	X	X		

TITLE: Turtle Trivia

GRADE LEVEL: 3 - 5

PURPOSE: The students will be able to identify the characteristics of various types of turtles.

PLAYERS: 2 - 4

MATERIALS: 34 index cards, construction paper, light green, white and dark green felt.

PREPARATION: Mount the directions, spinner and answer key separately on construction paper. Using the turtle patterns provided, and the felt, cut out five light green turtle shells. Out of the dark green felt, cut five each of all the other body parts. On a piece of white felt, glue one completed felt turtle as in the example. Label this "Trivia Turtle." On the 34 index cards, number and write the following questions:

1. How many species of turtles are there?
2. Are turtles warm-blooded or cold-blooded?
3. What does the turtle have that no other reptiles have?
4. Why did the United States Food and Drug Administration ban the sale of most pet turtles?
5. What kind of turtles have a short heavy neck that cannot be completely drawn back into the shell?
6. What is the part of the shell that covers the turtle's back called?
7. What is the part of the shell that covers the turtle's belly called?
8. What do turtles use to cut food?
9. Do turtles have teeth?
10. How do turtles bear their young?
11. What does the mother turtle do after she lays her eggs and covers them with soil?
12. What do turtles eat?
13. In what kind of a climate can a turtle not survive?
14. How many "families" of turtles are there?
15. Name at least three of the different turtle families.
16. What kind of turtles give of a foul smelling substance called musk?
17. What is the name of a common musk turtle?
18. What turtle family has the largest number of species?
19. What turtle family has the largest shell?
20. What turtles bend their necks sideways or horizontally when going into their shell instead of pulling their necks straight back or vertically into their shell?
21. True or false? A turtle is a reptile with a shell.
22. What is a scute?
23. True or false? Turtles are air breathers and have lungs?
24. Do turtles hibernate?
25. What is the largest freshwater turtle in the world?
26. What is the largest turtle?

27. What kind of turtles have stout elephantine limbs with claws?
28. What kind of turtles have webbed feet and long claws?
29. What kine of turtles have flippers and long digits?
30. Can turtles hear well?
31. Can turtles smell?
32. Can turtles see?
33. Are turtles sensitive to touch on their shells?
34. Are turtles sensitive to touch on their limbs?

ANSWER KEY

1. about 255
2. cold-blooded
3. a shell
4. Medical researchers discovered that many of these turtles carried bacteria that caused salmonella poisoning.
5. sea turtle
6. carapace
7. plastron
8. beak
9. no
10. lay eggs
11. The female turtle walks away after covering her eggs and does not return.
12. Most turtles are omnivores. They eat both plants and animals.
13. cold throughout the year
14. eleven
15. freshwater turtles, box turtles, leatherback turtles, snapping turtles, softshell turtles, tortoises
16. any mud or musk turtle (Stinkpot is one kind of musk turtle.)
17. Stinkpot, Loggerhead Musk Turtle.
18. freshwater and box turtles
19. sea turtles
20. side-necked or hidden-necked turtles
21. true
22. the large bony scales on the turtle's shell
23. true
24. yes
25. Alligator Snapping Turtle
26. leatherback
27. tortoise or turtle that lives on land
28. freshwater turtles or turtles that live in water
29. sea turtles
30. no
31. yes
32. yes
33. yes
34. yes

DIRECTIONS: OJBECT: To identify the characteristics of various types of turtles.

1. Place all the turtle body parts and the spinner in the middle.

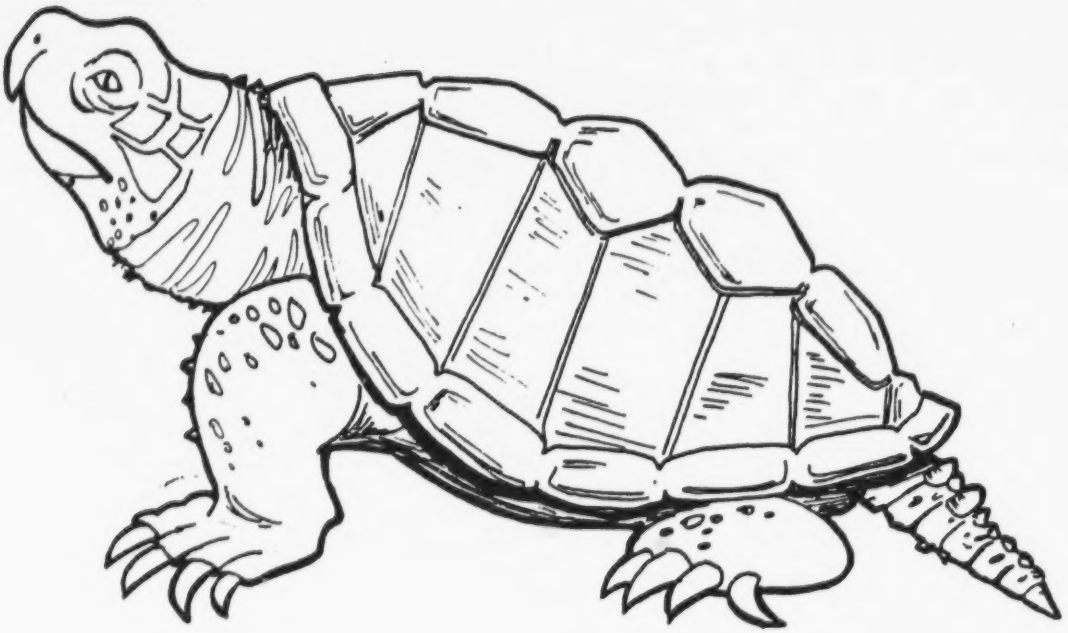
2. Shuffle the trivia cards and place them face down in the middle.

3. To begin the game. the tallest person draws a trivia card and answers the question. Return the card to the bottom of the trivia card pile.

4. The player to your right checks the answer key.

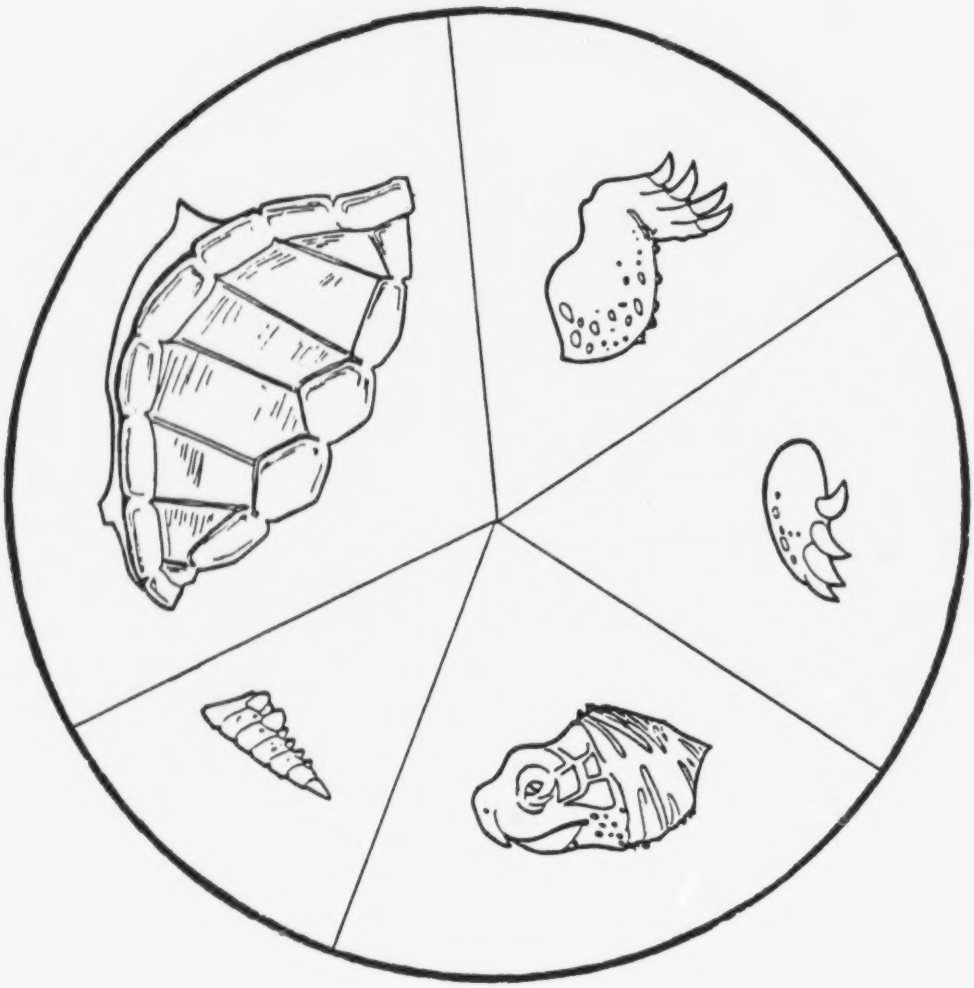
5. If the player answers the question correctly, he may spin for a turtle body part. If the spinner lands on a line, spin again. If the player already has that turtle body part, his turn is over.

6. Play continues in this manner until a player has his turtle completed like "Trivia Turtle." That player is the winner!

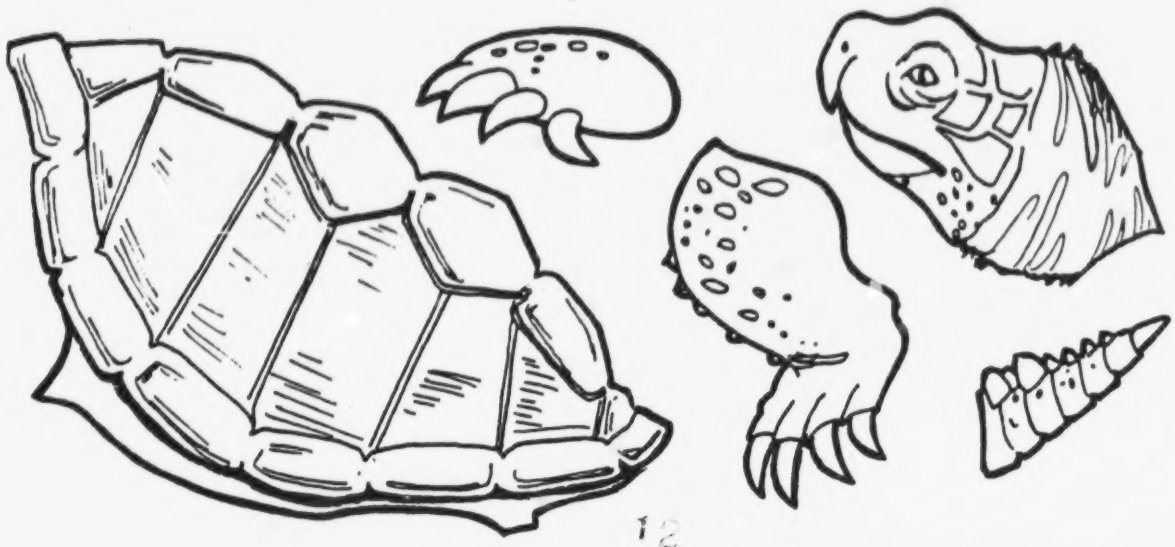


"Trivia Turtle"

Spinner



turtle pattern



TITLE: Traveling Groups

GRADE LEVEL: 2 - 5

PURPOSE: Students will be able to distinguish between different animal traveling groups.

PLAYERS: 2 - 4 players

MATERIALS: Blue and yellow construction paper, animal pictures, black marker.

PREPARATION: Cut out 25 blue fish cards and 25 yellow fish cards. Glue animal pictures on the blue set of 25. Label each animal on the card. On the yellow set write the different traveling groups to correspond to the first 25. Type the directions and answer key on construction paper. Make four answer keys for reference. A suggested animal list and answer key is:

Alligator - Loner
Bear - Sloth
Bee - Swarm
Bird - Flock
Cow - Herd
Dolphin - Flock
Duck - Paddling or Raft
Fish - School
Fox - Skulk
Frog - Army
Giraffe - Herd
Gorilla - Band
Hippopotamus - Bloat
Kangaroo - Troop
Lion - Pride
Monkey - Band
Owl - Parliament or Staring
Quail - Covey
Rhinoceros - Crash
Seal - Pod
Sheep - Flock
Skunk - Loner
Snake - Loner
Squirrel - Loner
Whale - Pod or Gam

DIRECTIONS: OBJECT: To be able to distinguish between different animal traveling groups.

You are to match the pictures of the animals (Blue Fish) to the word (Yellow Fish) that tells what the name of the group is in which they travel. For example: Whales travel together in a pod. You may refer to the answer key as you play the game.

1. The person who has the most animals living in his house will be the dealer.

2. Put the blue fish (animals) in one pile and the yellow fish (traveling groups) in a second pile face down.

3. Each player is dealt 3 blue fish cards and 3 yellow fish cards. Place these face up in front of you.

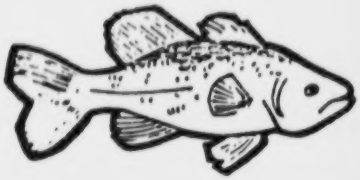
4. The player to the left of the dealer will start by drawing a card from the yellow fish card pile and the blue fish card pile. Make as many 2 card "books" as you can using these and the cards in your hand. For example: the whale and the pod together make one "book."

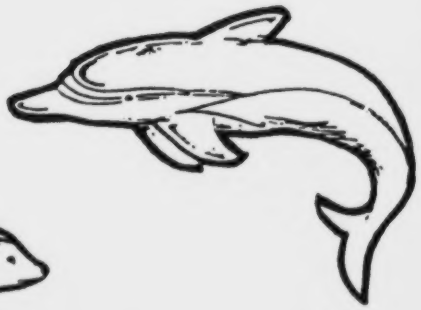
5. Check the answer key for correct matches. If you make a "book," discard 1 yellow fish card and 1 blue fish card.

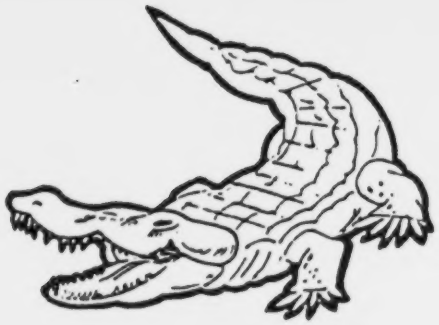
6. If you don't make a "book," discard one yellow fish card and one blud fish card. Put them back underneath the pile.

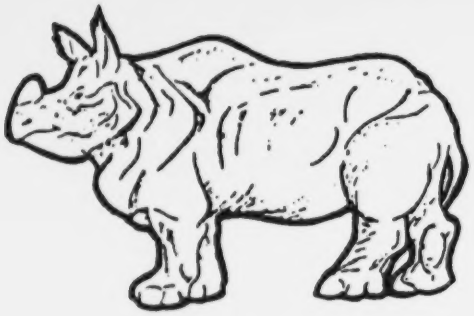
7. Play continues in this manner until one person is able to match all of his blue fish cards. That person is the winner.

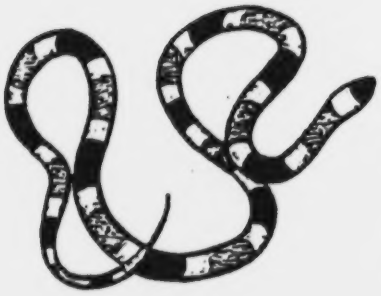
NOTE: Animals who travel alone are called "Loners."

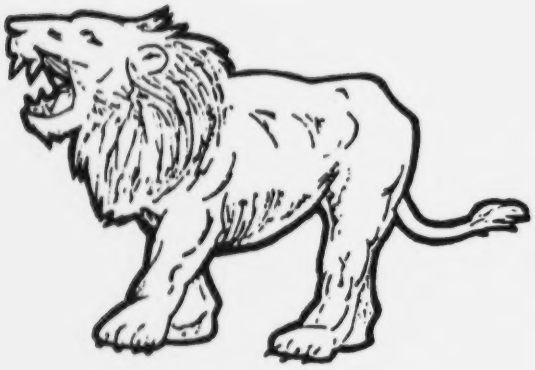


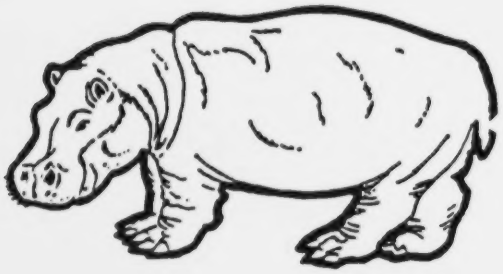


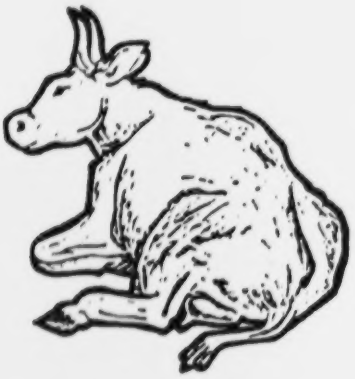


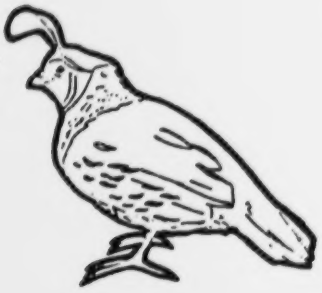


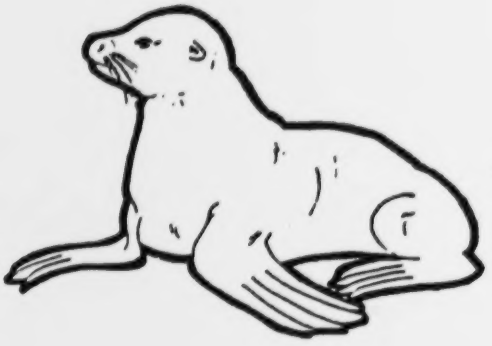


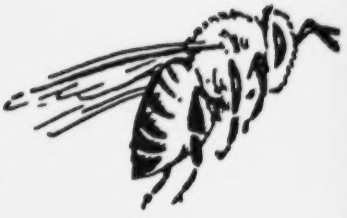




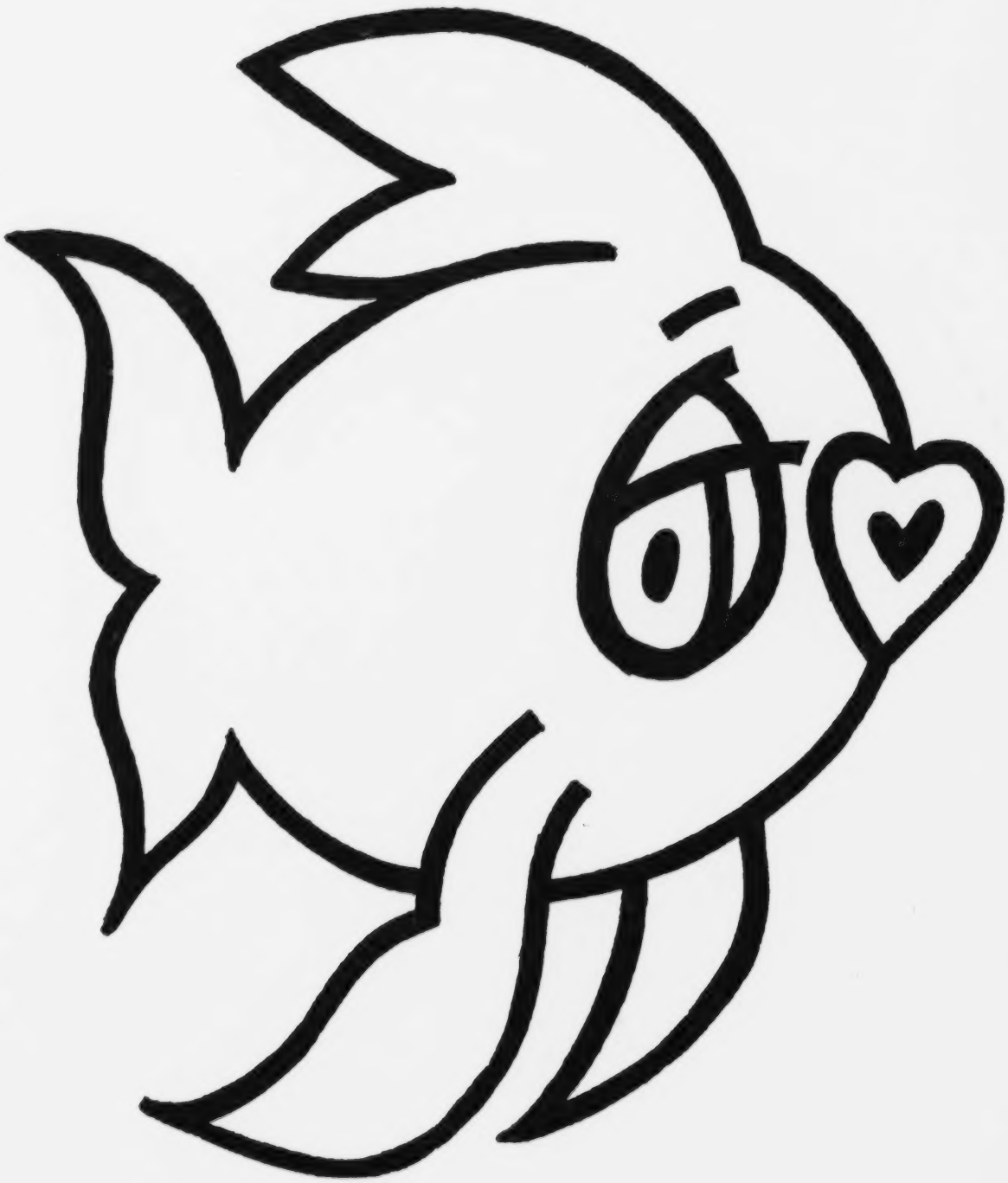








fish pattern



TITLE: Silly Snakes

GRADE LEVEL: 3 - 6

PURPOSE: To reinforce the students' knowledge of snakes.

PLAYERS: 2 - 4

MATERIALS: Construction paper (white, green and yellow), green poster board, green and yellow adhesive dots, 4 different colored pieces of pipe cleaner, a book about snakes

PREPARATION: Mount the directions on construction paper. Make 15 - 4" x 6½" yellow cards and 21 - 4" x 6½" green cards. On the green cards, type the following questions or statements (type the answers on the back):

Snakes do not have ears so how do they hear? (by its body picking up vibrations from the ground)
Name one of the four types of poisonous snakes that are found in the United States. (Coral Snake, Rattlesnake, Copperhead, Cottonmouth)
Are snakes reptiles? (yes)
True or False: A snake may shed all of its outside skin. (true)
Name one snake that gives birth to living snakes. (Garter, Boa, Red-bellied Snakes, Pit Vipers, Water Snakes, Crayfish Snake, Swamp Snake, Earth Snakes, Brown Snake, Lined Snake, Ribbon Snake, Copperhead)
How many times per year does a snake shed its skin? (3 or 4 times)
Do snakes have eyelids? (no)
True or False: Eastern Diamondback Rattlers are the smallest poisonous snakes in the West. (false. They are the largest.)
How many species of snakes are found in the United States? (250)
Why does a snake flick its forked tongue? (The tongue picks up dust particles that give the snake sensations of both taste and smell.)
Can a snake smell? (yes)
True or False: Snakes are carnivorous. (true)
True or False: Other animals that a snake may eat exceed the snake's own body weight by 75%. (false. Meals eaten by a snake may exceed 50% of their own body weight.)
What snake is immune to venom of native poisonous snakes? (Kingsnakes)
Name the snake that is the largest pit viper without a rattle. (Cottonmouth)
True or False: You can tell how old a rattlesnake is by the length of his rattle. (false. Even though a new rattle-link is added each time the skin sheds, the rattles fall off or are worn off.

True or False: A snake cannot eat an animal that is larger than itself because it cannot open its jaws wide enough. (false. A snake's lower jaw spreads apart to accommodate oversized prey.)

True or False: Snakes disappear in daytime in the hottest months. (true)

True or False: The skin between a snake's scales is very tight. (false. The skin is elastic so their skin will expand when they eat large prey.)

True or False: Snakes digest their food slowly. Sometimes they will be sluggish for several days after eating. (true)

True or False: Snakes hibernate in the colder months. (true)

Mount the snake pictures (see patterns) on the 15 yellow cards. Number them. On the back of the cards mount the snake information (see Snake Information sheet). To make the gameboard cut 26 - 2" x 2" squares out of green poster board. Cut 26 - 1½" x 1½" squares out of white paper. Glue them on top of the green squares. Stick green and yellow dots on the squares alternating colors. Put the following statements on some of the squares instead of dots:

Ate a rodent for lunch. Go forward 2 spaces. Your turn is over.

Cool weather for travel. Go back 2 spaces. Your turn is over.

Met up with a human. Ran in fright. Go forward 2 spaces. Your turn is over.

Found shelter and rested for the day. You lose you next turn.

Too hot to gravel. Go back 2 spaces. Your turn is over.

Had to shed skin. Go back 2 spaces. Your turn is over.

Make a head and tail for the snake gameboard. Label the head "start" and the tail "hibernation." Tape the squares together in a wiggly pattern. Laminate the snake. Make 4 snake game markers by wrapping the pipecleaner around a pencil to give them a coiled appearance.

DIRECTIONS: OBJECT: To reinforce the students' knowledge of snakes.

1. Place both sets of the cards next to the snake gameboard with the answers face down. Choose a game marker.

2. The oldest player goes first.

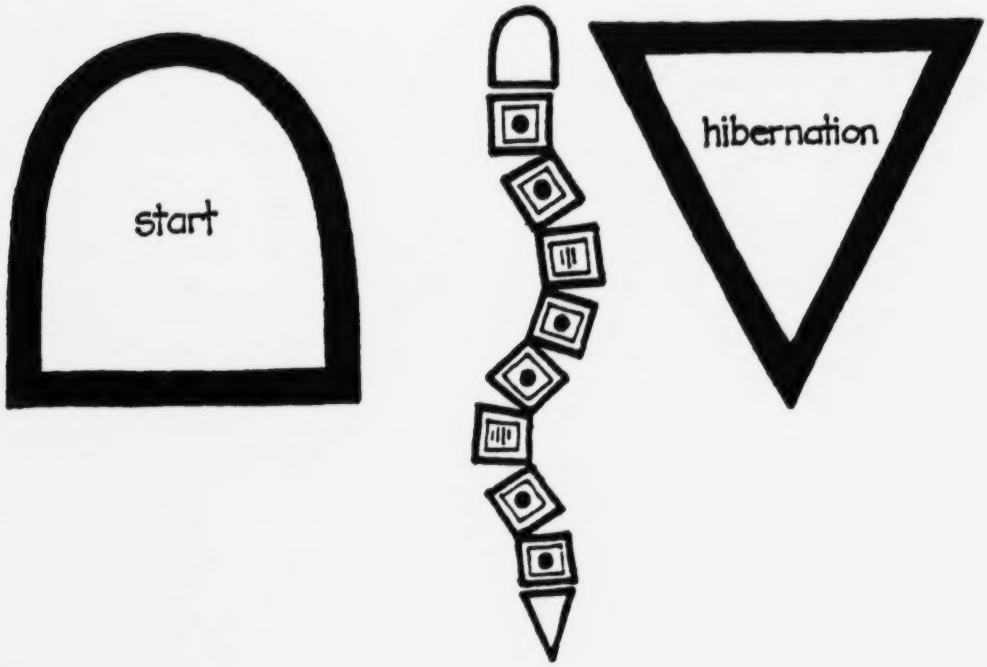
3. The first player rolls the die, moving the number that the die shows.

4. If the player lands on a yellow dot, he draws a yellow snake card. What is the name of the snake on the card? If he cannot answer the question correctly, he moves back to where he was. If he is correct, he can stay on the dot.

5. If a player lands on a green dot, he draws a green fact card. If he cannot answer the question correctly, he goes back to where he was. If he is correct, he can stay on the dot.

6. The answers are marked on the back of each card for checking. When you are through with a card, place it on the bottom of the deck.

7. The game continues until someone reaches the final resting spot - "hibernation." You must roll the exact number you need in order to land on finish and win the game.



SNAKE INFORMATION

#1 Racer
Large snake, 73 inches (185.4 cm)
Usually bluish, brownish or black above and below (except in yellow-bellied and it is yellow below). The throat and chin are white.
Body is long and slender - tail is very long.
It will fight when cornered.
It may be found in bushes and trees.
It lays eggs.

#2 Gopher Snake (Bullsnake)
Length, 36 - 100 inches (91.4 - 254.0 cm)
Above is light brown, clay, buff or whitish with blotches.
Body is stout - head is wider than neck.
It hides under objects, can dig and is good climber.
It kills prey by constriction.
It has a very loud hiss.
It lays eggs.

#3 Kingsnake (Sonora Mountain Kingsnake)
Length, 30 - 82 inches (76.2 - 208.3 cm)
It is usually black or dark brown with white or yellow rings. The Sonora Mountain Kingsnake has black rings split with red and yellow rings next to the black.
Lives mainly in mountains.
It kills prey by constriction.
It lays eggs.
The common kingsnake is immune from the venom of rattlesnakes.

#4 Night Snake
Length, 12 - 26 inches (30.5 - 66.0 cm)
Above is grey or yellowish with dark spots.
The body is moderately slender - the head is flattened.
It is active at dusk and night.
It will bit, but the venom, that is toxic to its prey, is harmless to man.

#5 Whipsnake
Length, 36 - 102 inches (91.4 - 259.1 cm)
It is dark gray with yellow tones, gray-brown, reddish to black. Light below.
The body is very slender - the head narrows - the eyes are large
It is fast, and can give a nasty bite when handled.
It lives in arid and semiarid regions, pastures and fields.
It eats lizards.

#6 Glossy Snake
Length, up to 36 inches (91.4 cm)
It has dark brown blotches in light brown above and a white unmarked belly.
Its head is narrow.
It lives in sandy soil.
It eats rodents and lizards.
It lays eggs.

#7 Patch-Nose Snake
Length, 20 - 30 inches (50.8 - 76.2 cm)
It has white, gray or yellow stripes with brown or black above.
It lives in mountain woodlands or brushy desert.
It is fast and burrows.

#8 Coral Snake
Length, 15 - 21 inches (38.1 - 53.3 cm)
It has red bands bordered by yellow, and black rings next to the yellow.
It has rigid, hollow fangs toward the front of the mouth.
Its body is moderately slender and flattish.
It spends much of its time underground.
The venom is very poinonous to man.

#9 Ringneck Snake
Length, 12 - 30 inches (30.5 - 76.2 cm)
It has a yellow neck ring, a bright orange to red belly and an olive or bluish-black above.
It lives in wooded areas usually under objects, or found in gardens.
It coils and waves its tail when caught.
It is often called the "thimble snake."

#10 Sidewinder
Length, 17 - 31 inches (43.2 - 78.7 cm)
It is light brown with blotches and dark spots on sides.
Its body is stout and head is large with hornlike projections over the eyes.
It lives in the desert.
It travels by moving its body forward sideways in a looping S-series.
Its venom is deadly, but its small size makes it less dangerous than other western rattlesnakes.

#11 Diamondback Rattlesnake
Length, 30 - 89 inches (76.2 - 226.1 cm)
It's usually gray-brown with brown diamond shaped blotches.
It lives in desert and bushy areas.
It defends ifself when it meets an enemy.
It's one of the most dangerous of the rattlesnakes

#12 Garter Snake (Western Aquatic Garter Snake)
Length, 18 - 57 inches (45.7 - 144.8 cm)
There is a stripe down the middle of the back with brown on the sides and and light green or yellow below.
It lives in water habitats - streams, lakes, rivers.
It hides in the water when alarmed.

#13 Boa (Rubber Boa)
Length, 14 - 29 inches (35.6 - 73.7 cm)
Above is tan to dark brown with a yellowish or bluish tinge.
It is sometimes called a two-headed snake because the tail is as short and blunt as the head. It has no neck.
It lives near coniferous forest under objects or inside rotten logs.
It is a good climber, swimmer and burrower.
It bears its young alive.

#14 Garter Snake (Northwestern Garter Snake)
Length, 14 - 26 inches (35.6 - 66.0 cm)
Above is black, brown, greenish or bluish with 3 long stripes (yellow, orange, red or blue).
The head is narrow.
It lives in humid, dense forest meadows.
It is a docile, retiring snake.

#15 Shovel-Nosed Snake
Length, 10 - 16 inches (25.4 - 40.6 cm)
Above is yellow or white with black or brown semi-bands.
It lives in sandy places, brushy desert, or rocky areas.
It comes out at night only.
It burrows underground to 2 feet.
It may strike but will do no harm.

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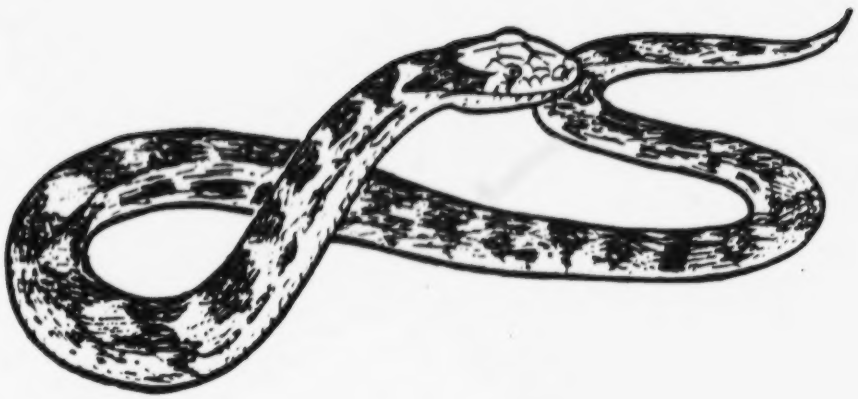

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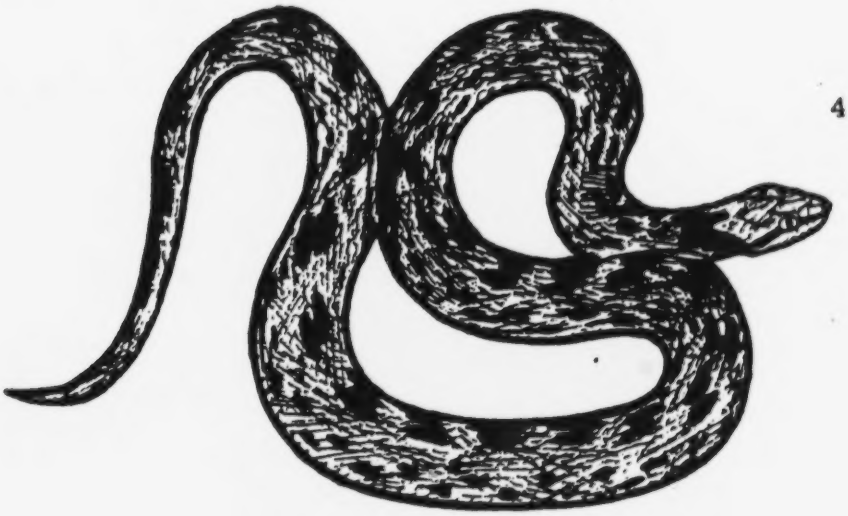

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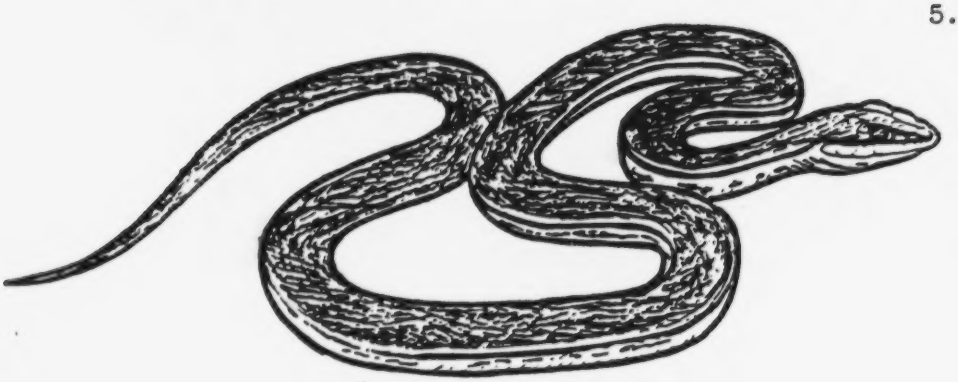

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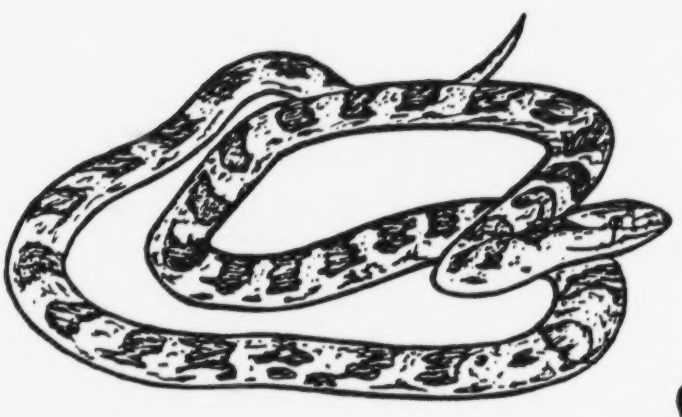

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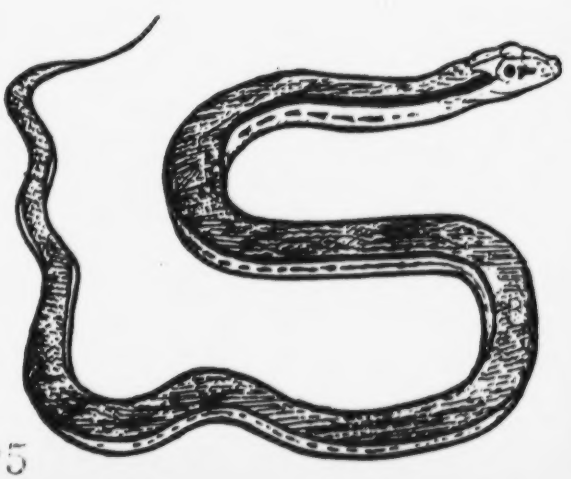

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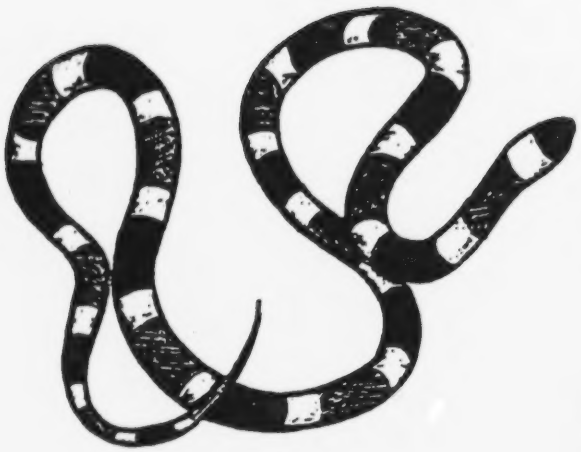

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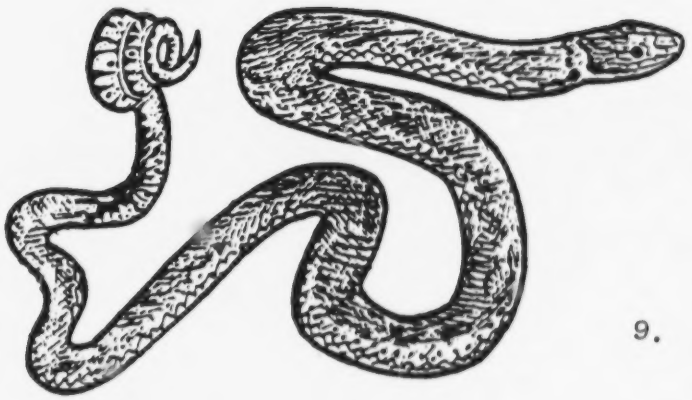

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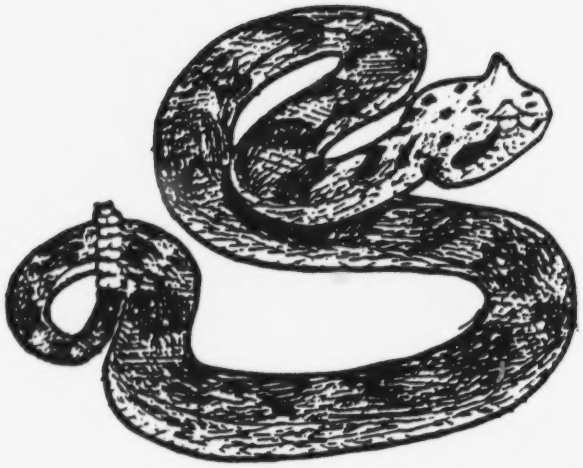

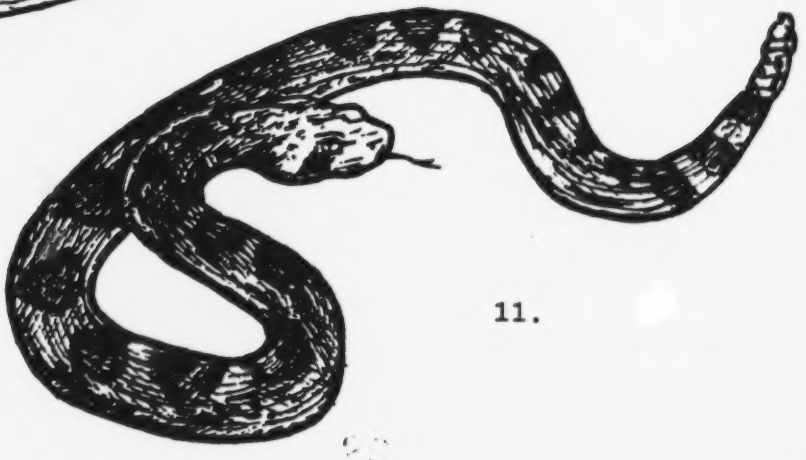

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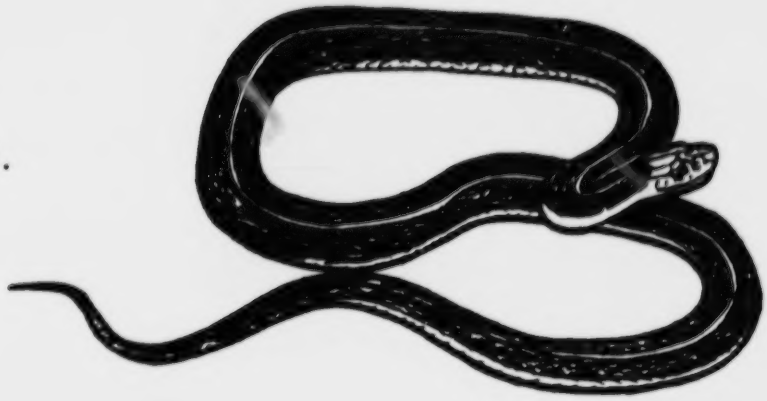

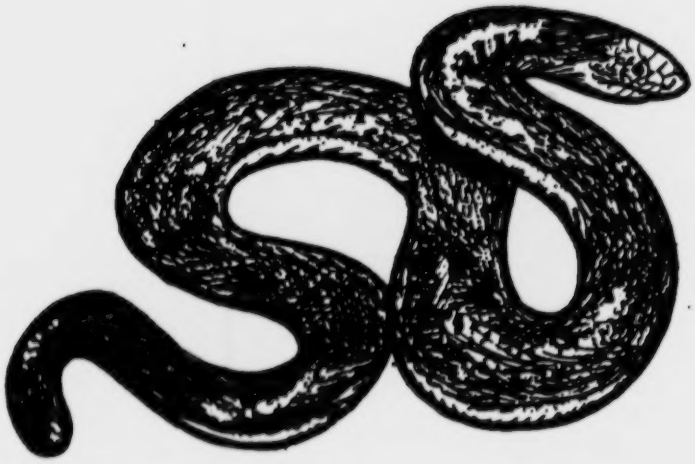

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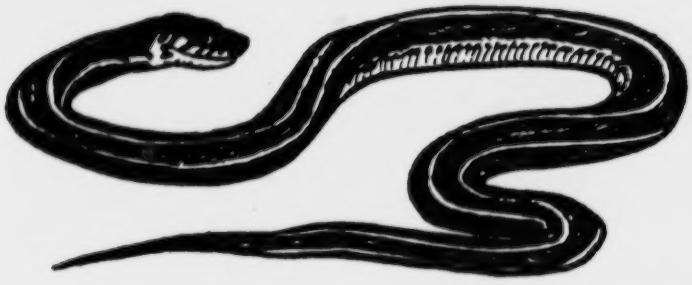


15.

TITLE: Watch Me Grow

GRADE LEVEL: 1 - 3

PLAYERS: 2 - 4

PURPOSE: The students will identify the four stages of the butterfly metamorphosis from egg to adult.

MATERIALS: Black, yellow, orange, blue, light green, beige, and brown felt, construction paper, spinner, poster board, felt-tipped marker

PREPARATION: Using the patterns and felt, construct four butterflies, four eggs, four caterpillars and four chrysalises. Mount the directions on a construction paper butterfly. Mount the metamorphosis wheel on poster board and construct a spinner (refer to pattern page). Mount the "Metamorphosis - A Change in Form" information on construction paper.

DIRECTIONS: OBJECT: To complete the metamorphosis cycle of a butterfly.

1. Read the "Metamorphosis - A Change in Form" information card to refresh your memory as to the definition of metamorphosis. Place the spinner wheel and felt game pieces on the table in front of you.

2. The youngest player begins play by spinning the metamorphosis wheel. The spinner must land on the first stage (egg), second stage (larva), third stage (pupa), and fourth stage (adult) in order to complete the stages of metamorphosis. If the spinner lands on a line, spin again.

3. As you spin and the spinner lands on the right stage, take that stage from the felt game pieces on the table and lay it in front of you. You may spin again.

4. If you do not land on the stage you need, your turn is over.

5. The first player to reach the adult stage of metamorphosis is the winner.

"Metamorphosis - A Change in Form"

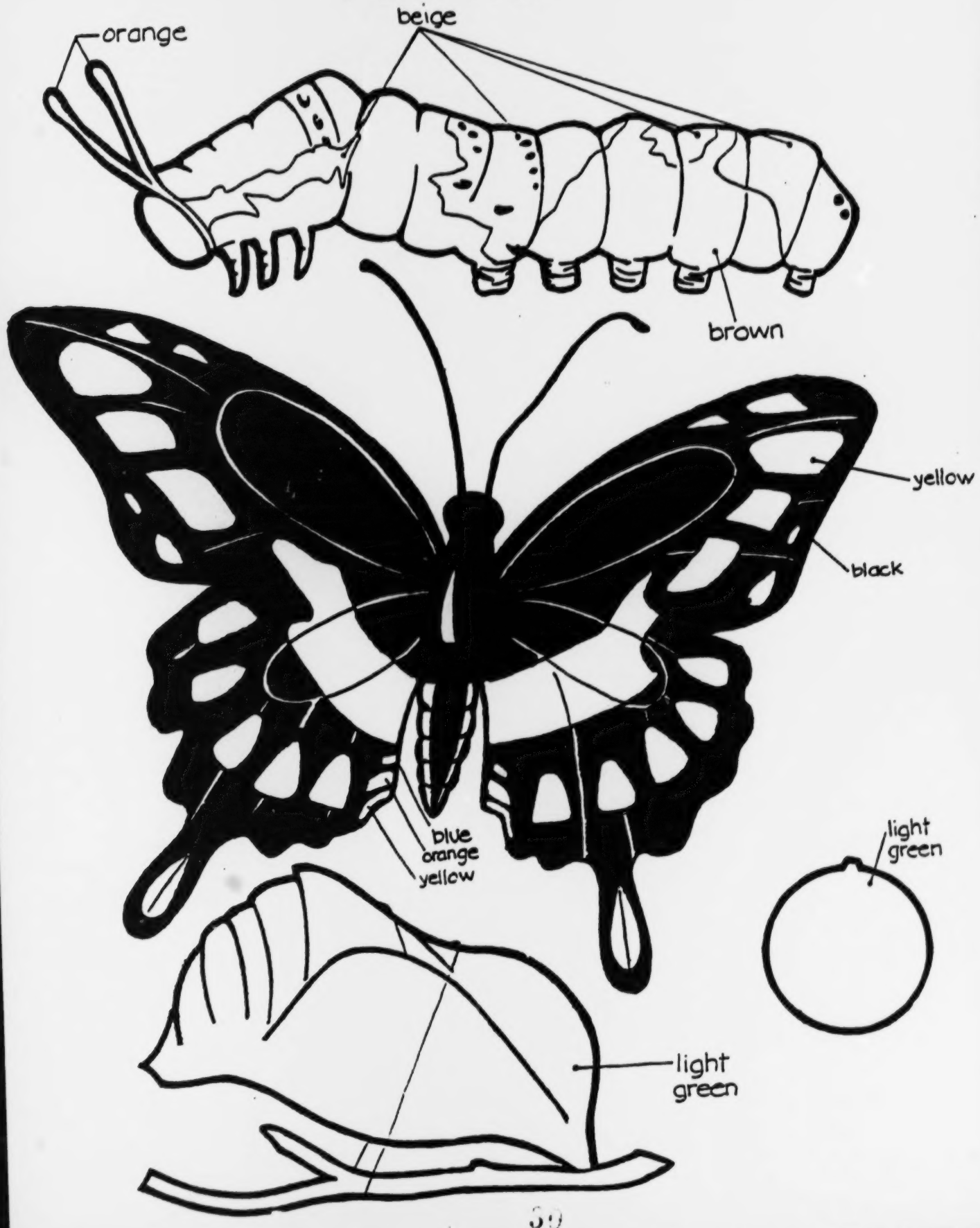
Butterflies change form as they grow. They go through four stages, looking different in each one. They begin life as tiny eggs. The adult female lays her eggs on the underside of leaves and twigs. A Giant Swallowtail Butterfly chooses citrus leaves.

In a few days the eggs hatch. From the egg crawls a caterpillar (larva). It starts to eat the leaves. As the caterpillar eats, its body grows and grows, right out of its skin! While eating and growing, the caterpillar sheds its skin several times.

Soon the caterpillar enters a resting stage (pupa). Butterfly caterpillars spin smooth chrysalises, which hand from a twig or branch. The chrysalis is a small house in which the caterpillar rests while his body undergoes great changes.

After a period of time out comes a beautiful butterfly -- a delicate, feathery-soft creature that looks nothing like the lumpy, hungry caterpillar it once was. After it unfolds its wings and dries out in the sun, the butterfly is off to find a mate and lay eggs to start the whole process over again.

Patterns


orange
beige
brown
yellow
black
blue
orange
yellow
light
green
light
green

METAMORPHOSIS WHEEL
Stage 1
egg
Stage 2
caterpillar
(larva)
Stage 3
chrysalis
(pupa)
Stage 4
butterfly
(adult)

TITLE: Will You Survive?

GRADE LEVEL: 4 - 6

PURPOSE: The students will have practice in decision making in desert survival.

MATERIALS: Green construction paper, paper clips, bucket, dowel, string with magnet at the end

PREPARATION: Cut 24 cacti (see pattern) from the green construction paper. Fold them in half. Paper clip the ends together. On the outside of each cactus write a desert survival statement that can be answered by "true" or "false." On the inside write the answer, true or false, to the question. If the statement is false, tell why. Make up your own statements or use the following:

If you find a road, stay on it. (true)
You are only going on a short walk from your campsite so it is alright not to take water along. (false - You should always have water with you because your body requires water more than food.)
You cannot go even a few days without food without suffering harmful effects. (false - Dehydration is the problem rather then starvation. You can live 2 to 3 weeks without food.)
If you are stranded or lost in the desert, the most important item to have with you is a mirror. (true)
You should cover your head and shade your eyes. (true)
If you have food but not water, you should go ahead and eat. (false - The body uses water to process food. Eating would increase dehydration.)
When you get hot, you should remove some of your clothes. (false - You need to prevent sunburns. Clothes also retain the sweat and reduce water loss by evaporation.)
A bright fire is a good signal in the daytime. (true)
All cactus fruits are safe to eat. (true)
A bite from a scorpion or black widow spider may be deadly. (true)
If you have water, you should wait as long as possible to drink it and then you should only drink a little. (false - Drink water as you become thirsty to prevent dehydration from beginning.)
Your car breaks down in the desert. You should walk for help. (false - Stay with the car. It can provide shelter.)
If you don't have much water, you should keep your mouth shut as much as possible. (true)
Rattlesnakes always give warning by rattling. (false - They can strike without any warning.)

There are thunderheads in the sky, but it is not raining where you are so there is no reason to worry. (false - If it rains, you need to seek shelter. In the desert, dry washes can quickly flood.)

Some ripe cactus fruit provide enough moisture when eaten to prevent dehydration. (true - July/Aug.-Saguaro, Aug./Sept.-Prickly Pear.)

It is best to carry water in a glass container. (false - Water is so important that you should carry it in a container that will not break.)

You should carry at least one gallon of water for each person for each day of your trip. (true)

Never go into the desert without first telling someone where you are going. (true)

It is alright to go into the desert without telling anyone where you are going or when you will return. (false - If you have an accident, help will come more quickly if someone knows you have not returned and where to find you.)

If you have water - DRINK IT. Do not ration it. (true)

Disturb the natural appearance of your area. Lay out large signals and obvious designs. (true)

It is best to sit directly on the ground as it is cooler there. (false - Try to set a foot above the ground as it is 30° cooler.)

If your car breaks down in the desert, you should stay near it. (true)

Mount the directions on construction paper. Attach the string with the magnet at the end to the dowel to make a "fishing pole." Put the cacti in the bucket.

DIRECTIONS: Object: To identify important desert survival facts.

You and your family are stranded in the desert and are lost in unfamiliar territory. Do you know what you should do? Will you survive until help comes?

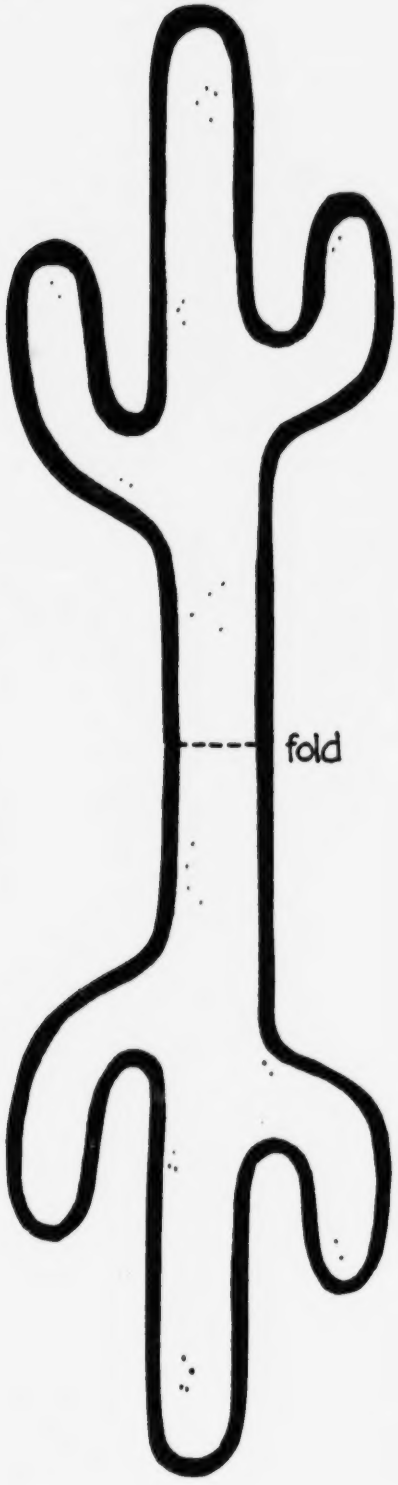
1. Put the cacti in the bucket. You will decide who will go first.

2. The first player uses the magnet on the pole to pick up a cactus.

3. To keep the cactus, the player must correctly answer whether the statement on the cactus is true or false. (If the answer is false, the player must also state the reason why the statement is false.) Check the answer by opening up the cactus. If the player is wrong, the cactus goes back in the bucket. Your turn is over.

4. Play continues in this manner.

5. When all of the cacti are out of the bucket, count how many you have. The one with the most survives!



cactus
pattern

TITLE: Habitats: Where Do We Live?

GRADE LEVEL: 2 - 6

PURPOSE: The student will become familiar with animal habitats.

PLAYERS: 2 players, 1 judge

MATERIALS: Construction paper, felt-tipped markers, 61 - 2½ x 3½ blank cards

PREPARATION: Mount the directions and answer key on construction paper. On the blank cards, prepare these quantities:

30 - Mount the provided animal pictures
10 - Write "Sea Habitat"
10 - Write "Desert Habitat"
10 - Write "Forest Habitat"
1 - Write "Jungle Friends"

ANSWER KEY

SEA HABITAT

1. Coralline Algae
2. Damselfish
3. Flying Fish
4. Hermit Crab
5. Lionfish
6. Moray Eel
7. Mussels
8. Red Emperor Fish
9. Seahorse
10. Starfish

DESERT HABITAT

1. Cactus Wren
2. Cane Cholla
3. Collared Lizard
4. Crested Lizard
5. Gila Monster
6. Kangaroo Rat
7. Night-Blooming Torch Cactus
8. Peccary
9. Roadrunner
10. Western Diamondback Rattlesnake

FOREST HABITAT

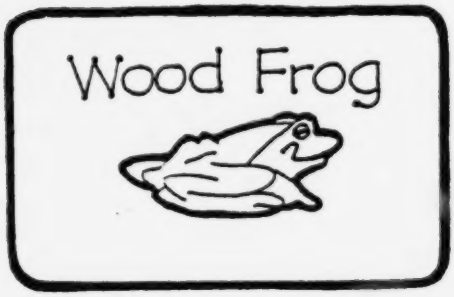
1. Black Bear
2. Goshawk
3. Kaibab Squirrel
4. Mountain Bluebird
5. Opossum
6. Red Fox
7. Red-Tailed Chipmunk
8. Scarlet Tanager
9. Wood Duck
10. Wood Frog

DIRECTIONS: Object: There are three habitats in this game. They are: the forest, the desert, and the sea. Each player must match the animal or plant card to their correct habitat. There is one card, Jungle Friends, that does not match any of the habitats. The player who holds this card at the end of the game cannot win.

1. The shortest player goes first and is the dealer.

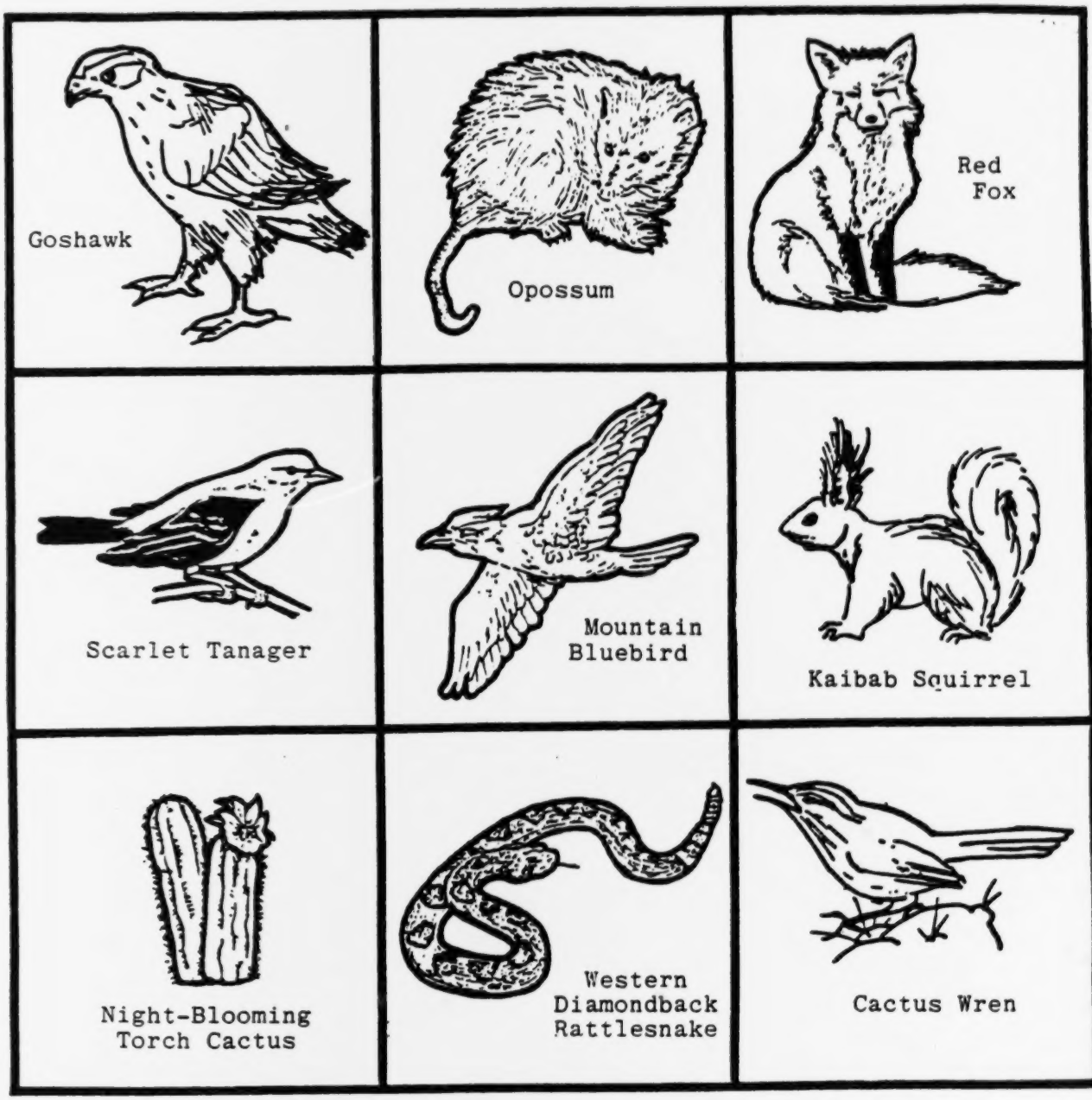
2. Deal out all of the cards to each player. Place them in your hand so that the other players cannot see the cards.

3. The first player draws one card from the player's hand on his right. All matches he has in his hand can be placed on the table face up in front of him at this time. He must tell the others what is in his match as he places it on the table. Check the answer key to see if he is correct.



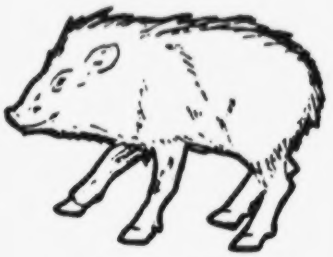
4. The players continue taking turns by drawing one card from the player on the right until no more matches can be made.

5. The first player to get rid of all of his cards is the winner!


Goshawk
Opossum
Red Fox
Scarlet Tanager
Mountain Bluebird
Kaibab Squirrel
Night-Blooming Torch Cactus
Western Diamondback Rattlesnake
Cactus Wren

Road-
runner

Gila Monster



Peccary

Flying
Fish

Crested Lizard

Kangaroo Rat

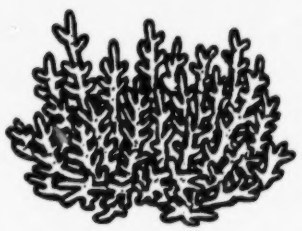
Wood Frog

Collared
Lizard

Black Bear

Red-tailed
Chipmunk

Cane Cholla

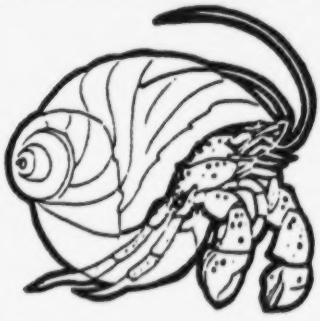


Coralline Algae

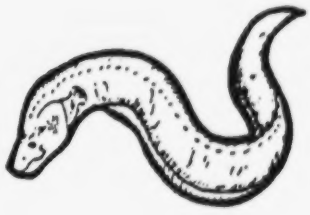
Wood Duck

Mussels

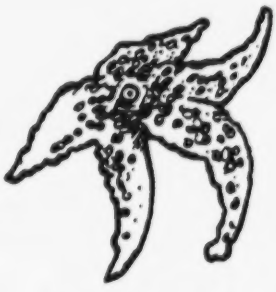
Sea-
horse



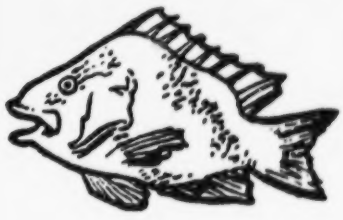
Hermit Crab



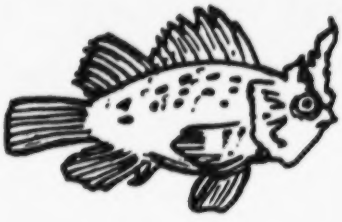
Moray Eel



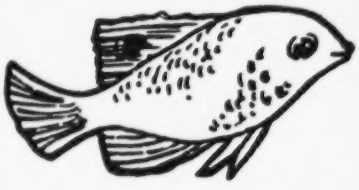
Starfish



Red Emperor Fish



Lionfish



Damselfish

TITLE: Heart Attack

GRADE LEVEL: 6 - 8

PURPOSE: The student will label and identify the functions of fourteen major parts of the heart.

PLAYERS: 2 - 4

MATERIALS: Poster board, felt-tipped markers, construction paper, paper.

PREPARATION: Using an opaque or overhead projector, enlarge the heart diagram pattern on a piece of poster board. Cut 14 - 2" x 2" cards out of construction paper. On one side of the card, type the definition. On the other side, type the term that corresponds to that definition. Use the following list:

Aorta - The largest artery in the body that carried blood from the left ventricle and distributes blood to all parts of the body except the lungs.
Bicuspid Valve - The atrioventricular valve between the left atrium and left ventricle.
Inferior Vena Cava - The main vein which brings blood from the lower portions of the body to the heart.
Interventricular Septum - This partition separates the two lower chambers, the right and left ventricles.
Left Atrium - The upper chamber that receives blood from four pulmonary veins.
Left Pulmonary Artery - The vessel that carries blood from the right ventricle to the left lung.
Left Pulmonary Vein - The vessel that returns blood from the left lung to the left atrium.
Left Ventricle - The lower chamber that pumps blood to the aorta.
Right Atrium - This upper chamber receives blood from all parts of the body except the lungs.
Right Pulmonary Artery - The vessel that carries blood from the right ventricle to the right lung.
Right Pulmonary Vein - The vessel that returns blood from the right lung to the left atrium.
Right Ventricle - The lower chamber of the heart that pumps blood into the pulmonary arteries.
Superior Vena Cava - The main vein which brings blood from the upper portion of the body to the heart.
Tricuspid Valve - The atrioventricular valve between the right atrium and the right ventricle.

Mount the directions on construction paper. In the game container, provide paper for students use to keep score.

DIRECTIONS: OBJECT: To label and identify the functions of fourteen parts of a heart diagram.

1. Place the cards on the board definition side up. Choose one player to keep score.

2. The player whose birthday is closest to Valentine's Day draws a card.

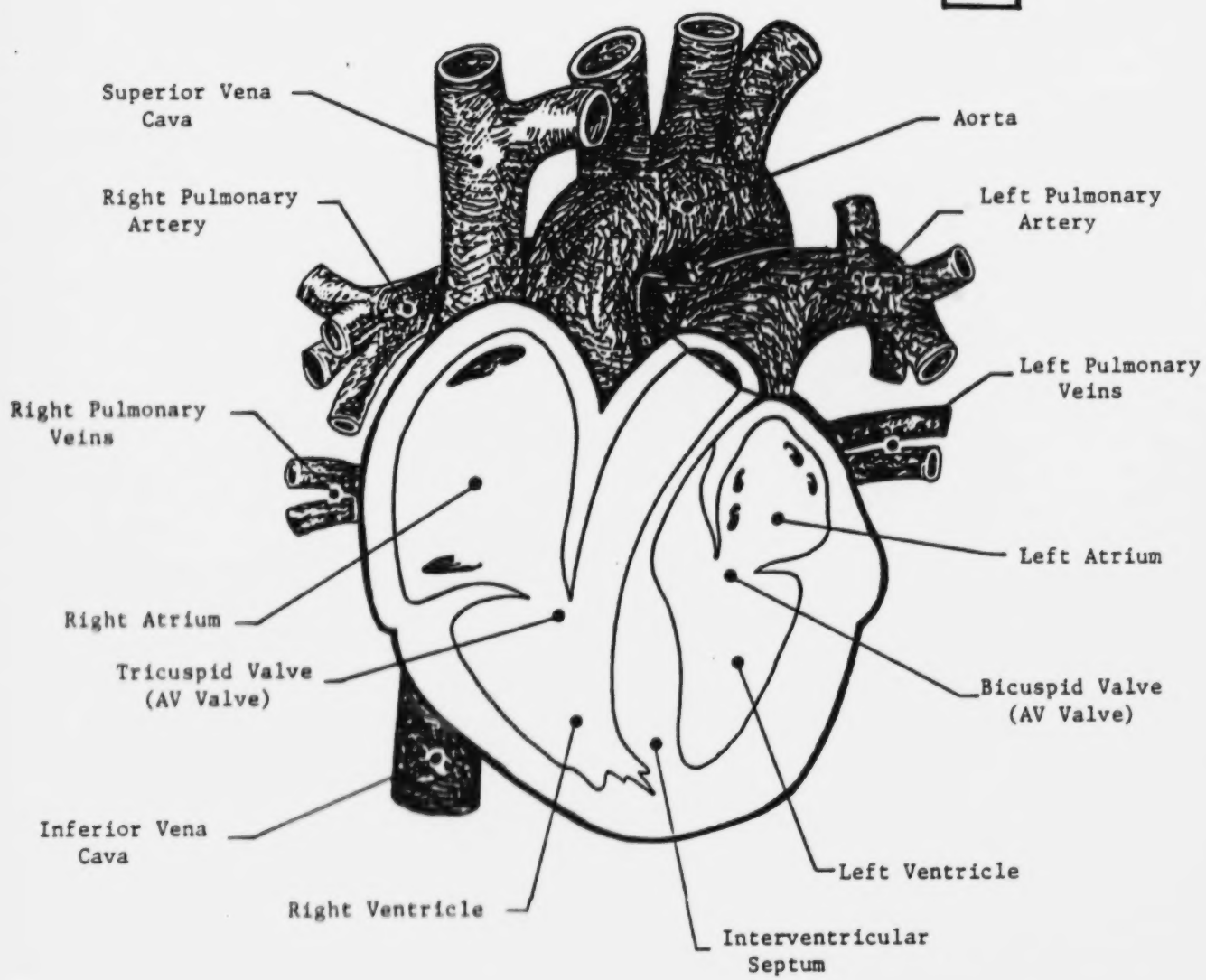
3. Read the definition on the card. Give the term this card defines. Turn the card over to check if you are correct. If you are correct, place the card answer side up on the correct dot on the gameboard. This will place you card on the correct area of the heart. You receive 5 points. Draw another card.

4. If your answer is incorrect, you lose 5 points. Return the card to the bottom of the pile. Your turn is over.

5. Play continues until all 14 cards have been placed on the board. The player with the most points wins the game!

HEART ATTACK

?cards



TITLE: Mr. Bones

GRADE LEVEL: 5 - 8

PURPOSE: The students will identify the scientific names of the bones of the body.

PLAYERS: 2 - 4 players

MATERIALS: 21" x 18" piece of felt, construction paper, spinner, poster board, felt-tipped marker.

PREPARATION: Make 6 Xerox copies of all the bone card pieces. Mount all the pieces separately on a poster board or construction paper. Cut out all the pieces. Take one complete set of bones and construct the skeleton on the piece of felt. Label the felt skeleton "Mr. Bones." Put each bone card (#1 - #15) in a separate small envelope. Glue that bone to the outside of this envelope. Mount the directions, the spinner, and the Mr. Bones Chart on construction paper.

DIRECTIONS: OBJECT: To identify the scientific names of the bones of the body.

1. Lay the skeleton bone packets and the spinner out in front of the group.

2. The youngest player begins play by spinning for a bone. If the spinner lands on a line, spin again. The player must say the scientific name of the bone on which the spinner lands before he can take that bone. If he forgets to say the scientific name of the bone, his turn is over.

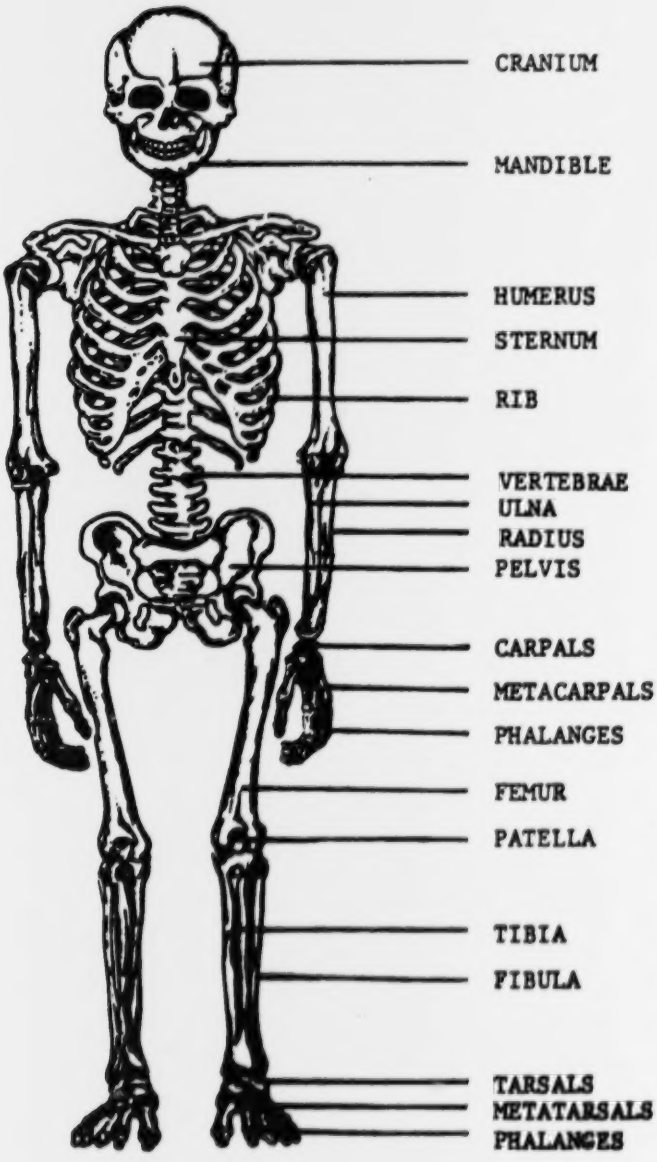
3. Check the Mr. Bones Chart for the correct scientific name. If there is more than one bone, all bones must be named.

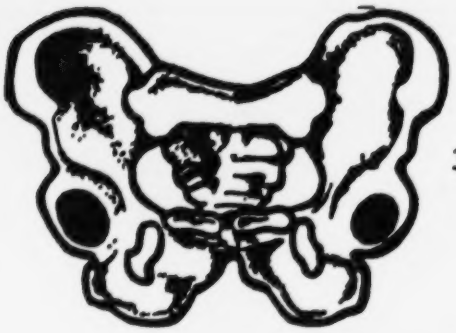
4. Each player, in turn, spins for bones of his skeleton and tries to be the first to complete his skeleton like Mr. Bones.

5. If you land on a bone you already have, your turn is over.

6. The first player to complete "Mr. Bones" is the winner!

MR. BONES
CHART





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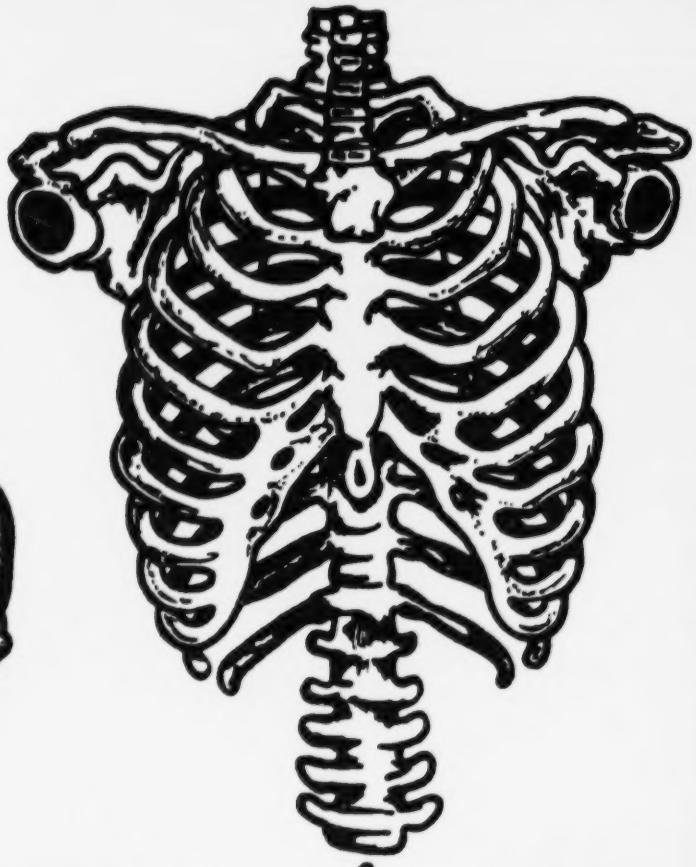


1.

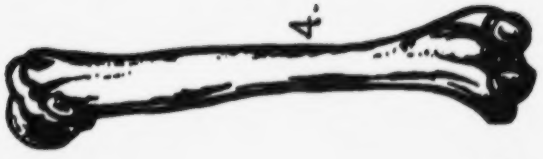
7.

9.

2.

bone card pieces

4.



15.

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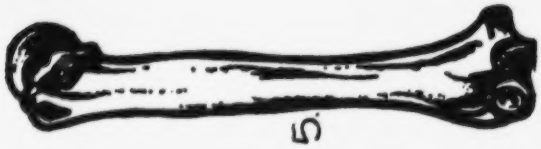

14.

13.

12.

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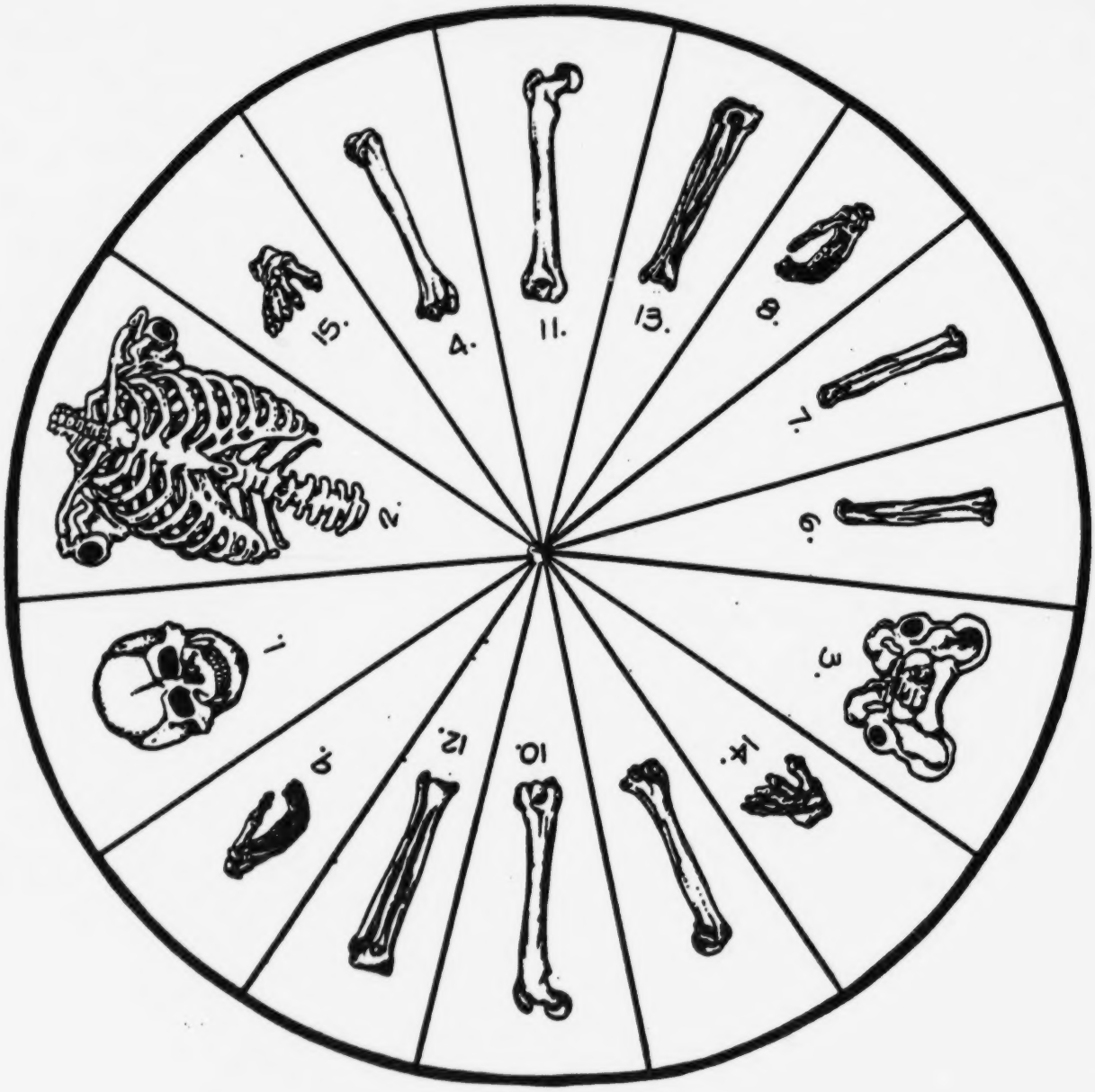


spinner

TITLE: Heart to Heart

GRADE LEVEL: 4 - 7

PURPOSE: The students will learn the pattern of blood flow through the heart.

PLAYERS: 2 - 4

MATERIALS: Construction paper, felt-tipped markers, felt - white (24" x 24"), red, blue and pink

PREPARATION: Mount the directions on a heart-shaped piece of red construction paper. Using the opaque or overhead projector, enlarge the gameboard pattern onto white butcher paper. Use white felt for the background of the gameboard. Use the butcher paper pattern to cut the following sections in order to "construct" the heart. Out of the pink felt, cut out sections 1, 2, 3, the pulmonary artery and the superior and inferior vena cavas. Glue the blue felt onto the pink heart in the correct positions. Out of the red felt, cut out sections 4, 5, 6 and the pulmonary veins. Glue the red felt onto the pink heart in the correct positions. Make 4 heart place markers (see pattern) using different colored paper on which to mount them. To construct the answer key booklet, make a 2 page heart-shaped leaflet that is just slightly larger than the answer key patterns. Mount the pictures on this according to the directions under each picture.

DIRECTIONS: OBJECT: To circulate your heart marker through the large heart like blood would circulate through the human heart.

1. Each player chooses a colored heart and places his heart on start.

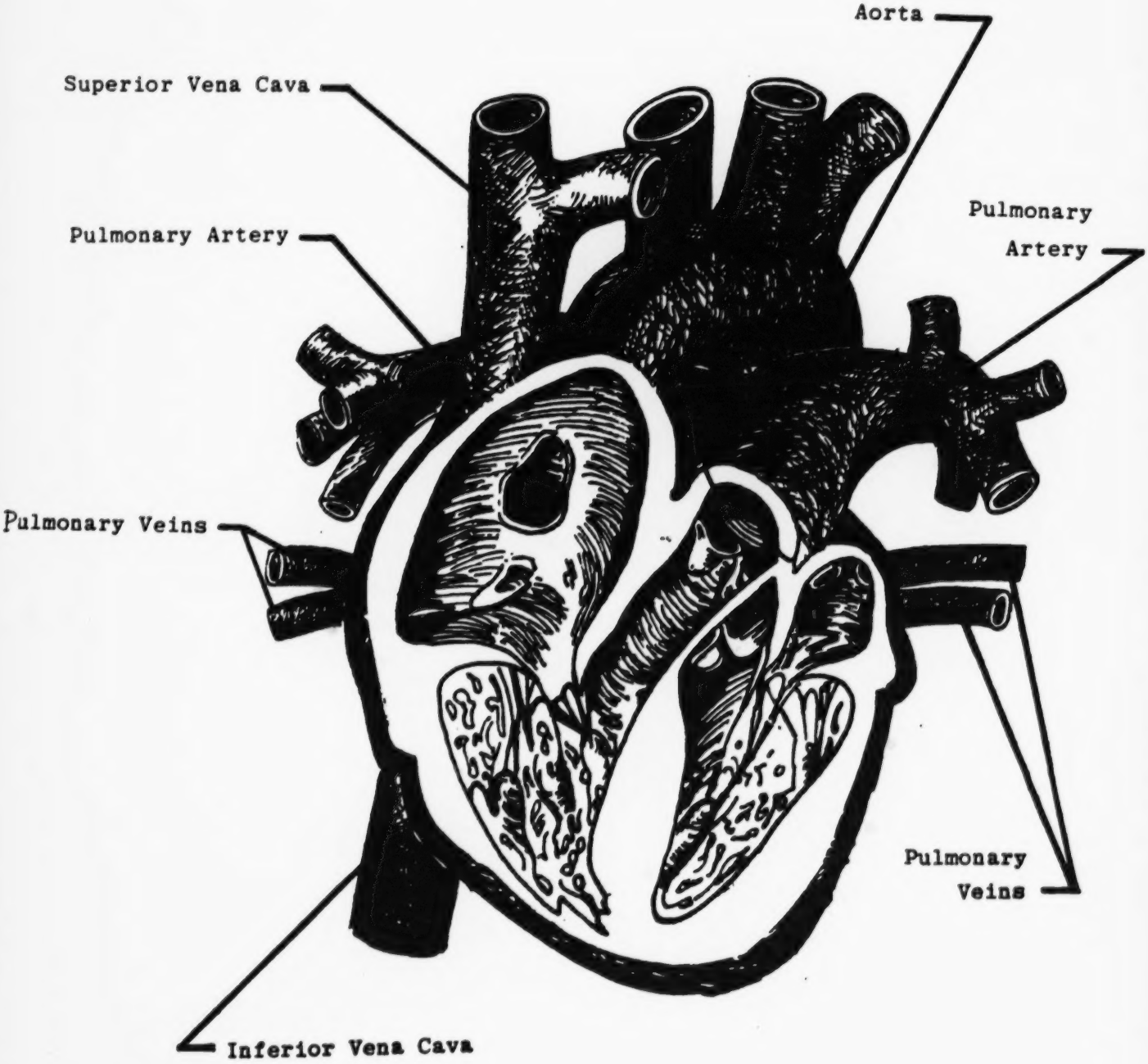
2. The oldest player begins play by rolling the die.

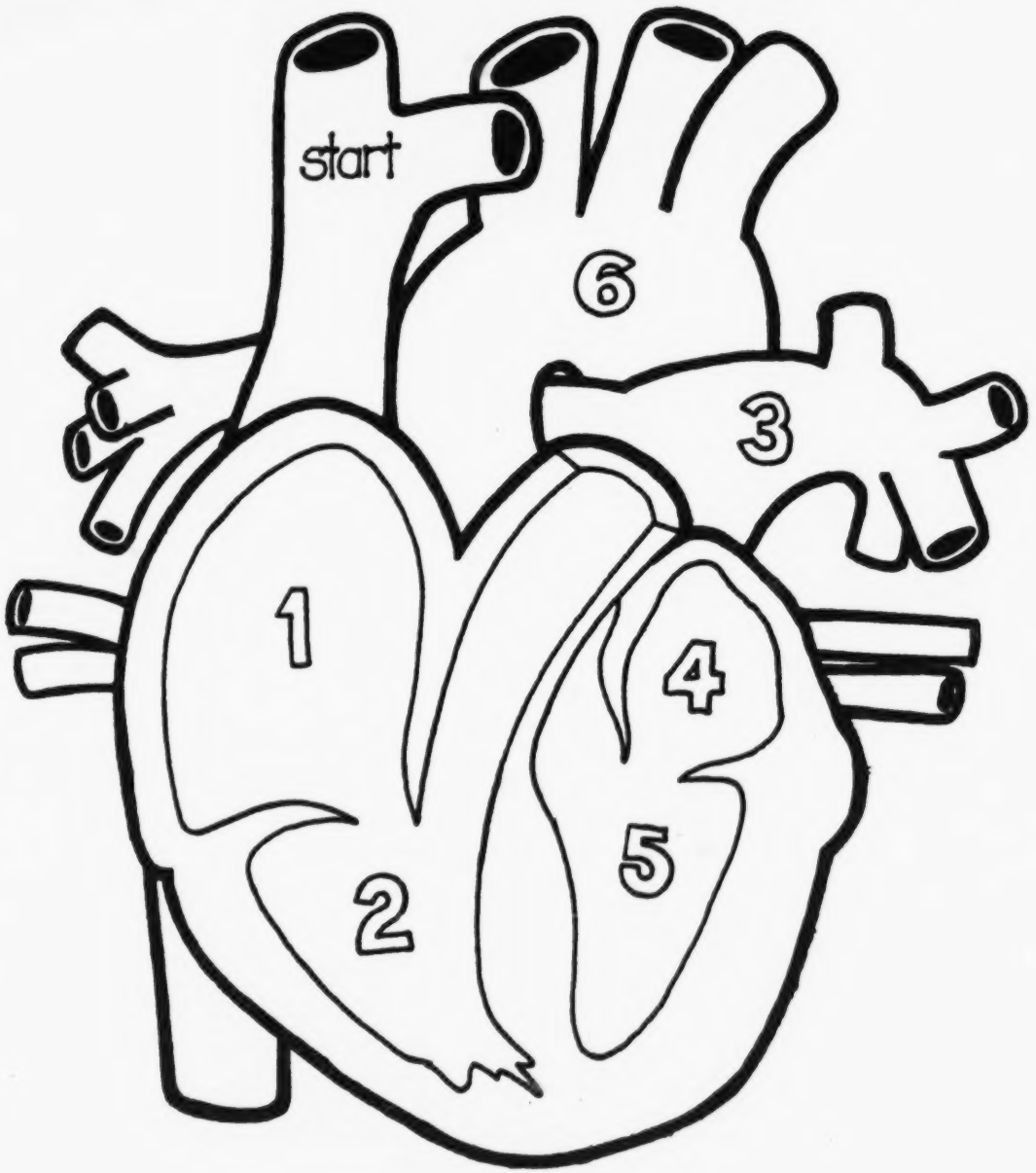
3. You must roll a #1 to get to chamber #1 (right atrium). You must roll a #2 to get to chamber #2 (right ventricle). If you do not roll a #2, your turn is over. Continue in this manner until you get to #6 (aorta).

4. Each time you land on a number, you must say the name of that area of the heart. You may use the answer key to do this. If you forget to name that area, you loose your next turn. If you give an incorrect name, you must go back to where you were.

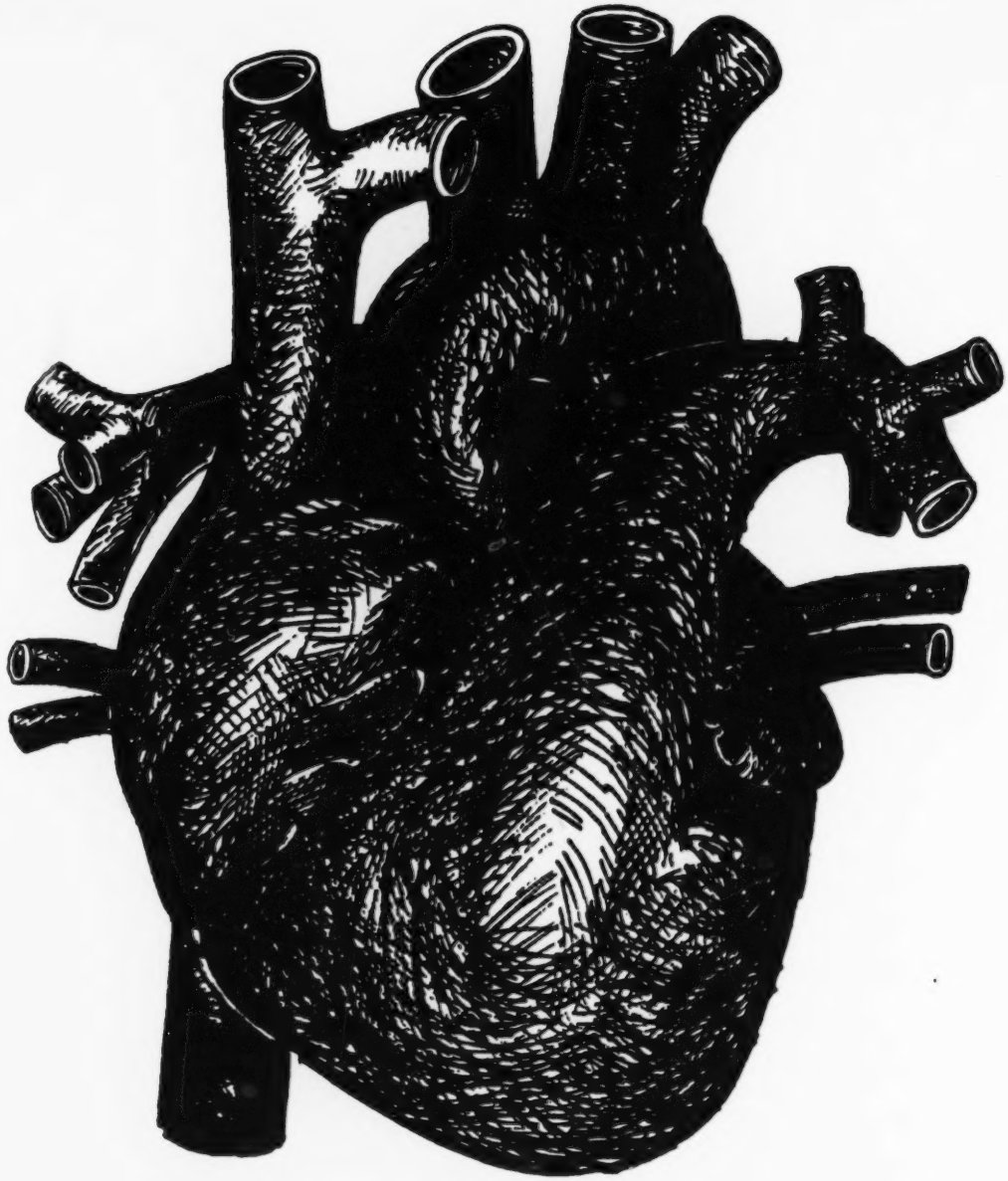
5. The winner is the first player to reach #6 (aorta). This means he has circulated through the heart like blood has circulated through the human heart.

Teacher Reference
Heart Diagram

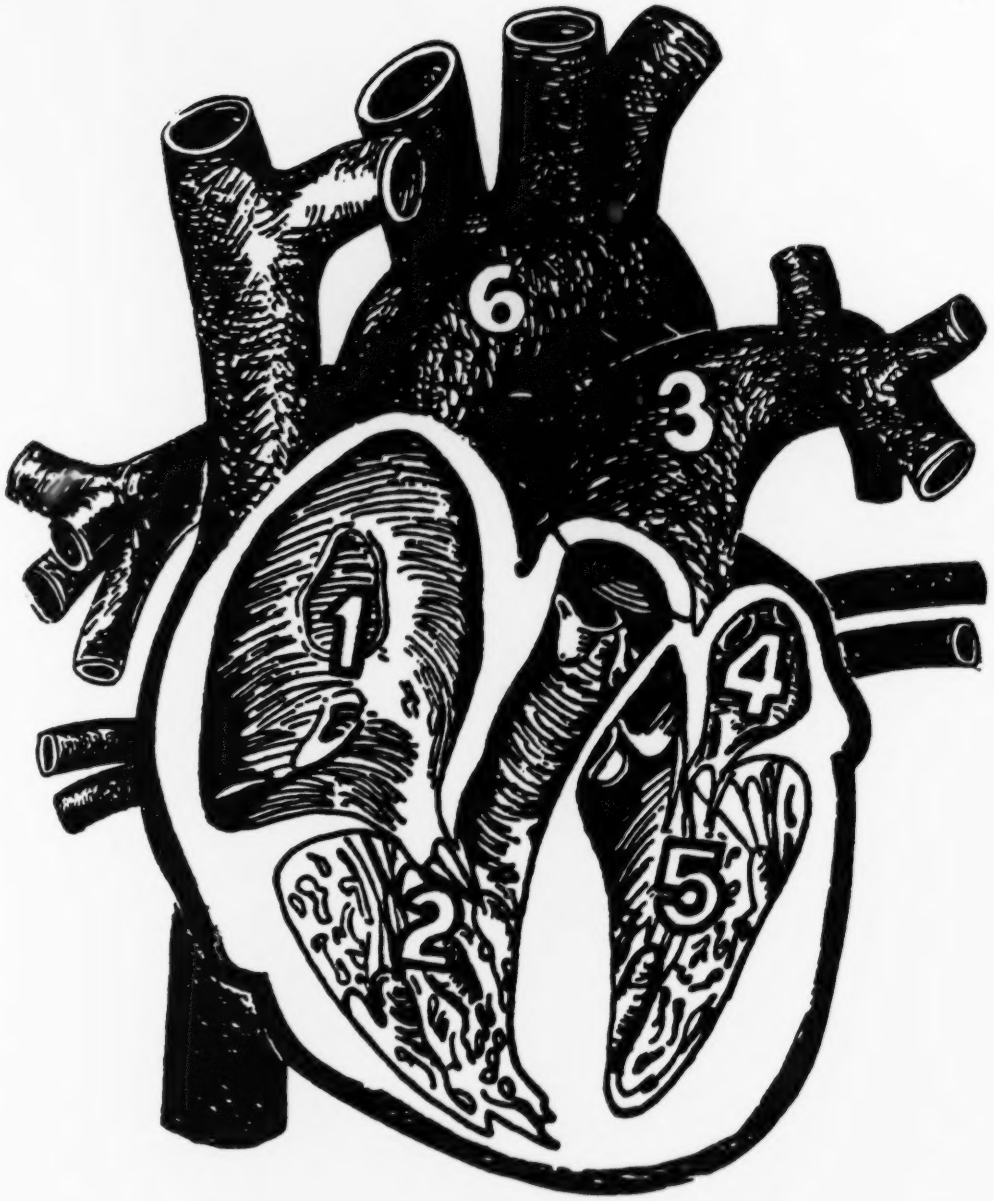




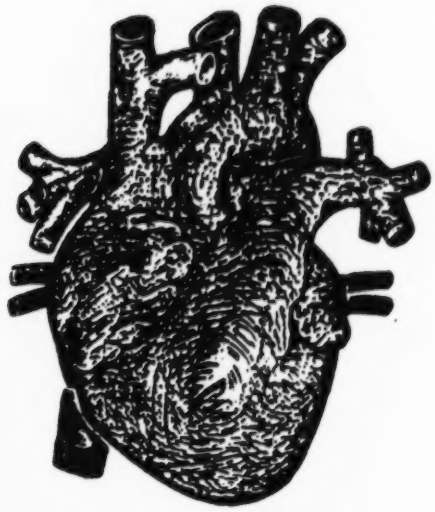
gameboard



Answer Key
(front cover)



Answer Key
(inside right page)



heart place markers

1 right atrium

2 right ventricle

3 pulmonary artery

4 left atrium

5 left ventricle

6 aorta

Answer Key
(inside left page)

TITLE: Land and Sea

GRADE LEVEL: 3 - 5

PURPOSE: The students will learn to distinguish between organisms that live in the land and sea habitats.

PLAYERS: 2 - 4 players

MATERIALS: 5" x 7" cards, construction paper, animal pictures that live on land or in the sea, felt-tipped markers or crayons.

PREPARATION: Use 25 - 5" x 7" cards. Cut out and/or color the animal pictures. This is a suggested list.

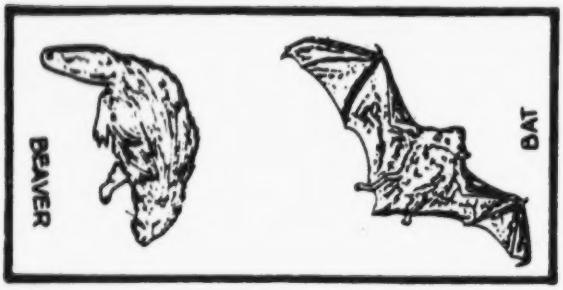
Sea	Land	
angelfish	admiral butterfly	
dolphin	ant	
dugong	bat	
flying fish	blue jay	
jellyfish	cheetah	
minnow	eagle	
oarfish	elephant	
octopus	falcon	rhinoceros
piranha	giraffe	scorpion
porpoise	hedgehog	umbrella bird
queensland grouper	jacana	wren
sea horse	kiwi	xenops
shark	leopard lizard	yapoks
tuna	moose	zebra
turtle	numbat	
whale	owl	
x-rayfish	quokka	
	quuah	

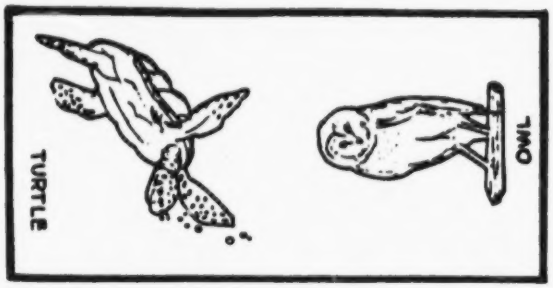
Glue one on each end of the card. Label each picture. Mount the directions and answer key on construction paper.

DIRECTIONS: OBJECT: To distinguish between organisms that live on land or in the sea.

1. The player that has the most animals at his house is the dealer.
2. Shuffle the cards well.
3. Deal out all of the cards so each player has the same amount. You may look at your cards.
4. The oldest player begins the play by laying out any card. The player to his right tries to match either end of the card with an organism that lives in a different habitat. Once you have laid your card down, you may not pick it back up.

For example: An organism that lives on land would live in a different habitat than an organism that lives in the sea.





5. You may only match the card that was laid down by the player before you.

6. If the player is unable to make a match, he must pass.

7. Check the answer key if unsure about a match.

8. The first player without any cards left is the winner!

NOTE: You may use the dictionary if you need help!

TITLE: Crazy Skeleton

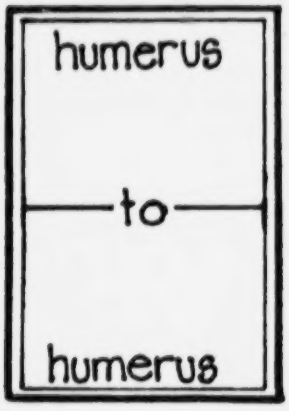
GRADE LEVEL: 4 - 6

PURPOSE: To give the students practice in identifying scientific names of bones of the human body.

PLAYERS: 1 judge and 2 to 3 teams of 2 players each.

MATERIALS: Poster board (light colored), construction paper, colored markers.

PREPARATION: Make 24 7½" x 5½" poster board cards using the following combinations (see example):



Carpals to Phalanges	Phalanges to Fibula
Cranium to Cranium	Phalanges to Patella
Fibula to Humerus	Radius to Cranium
Humerus to Humerus	Radius to Femur
Humerus to Scapula	Radius to Patella
Mandible to Cranium	Scapula to Scapula
Mandible to Humerus	Scapula to Vertebrae
Mandible to Metacarpal	Tarsals to Femur
Metatarsal to Tibia	Tarsals to Tibia
Metacarpal to Vertebrae	Tibia to Patella
Patella to Patella	Vertebrae to Cranium
Patella to Radius	Vertebrae to Metacarpals

Mount the bone name chart for the judge on construction paper. Mount the directions on construction paper, also.

DIRECTIONS: OBJECT: To identify the scientific names of bones of the human body.

1. Choose one person to be the judge. Judge watches all players to be sure they use the correct bones. Judge will use the "Bone Names" list. If the players need help on the scientific name, the judge will tell them the common name.
2. Place all cards on the floor in a pile face down.
3. Get into groups of two.
4. The first group to go is the one with the person in it who last had a broken bone.
5. Pick the top card.
6. Each card has two bones on it. The name of the bone on the card should match the bone on the body. Place the card between the bones of the two players.

7. Keep that card between the two of you. If it falls, your team is out! The judge will make all final decisions.

8. Keep playing by drawing cards and placing them between you and your partner's bones.

9. The winner is the last group to have all cards "in place."

Bone Name Chart

Carpals	= wrist
Cranium	= head
Femur	= thigh
Fibula	= leg (on outside)
Humerus	= upper arm
Mandible	= jaw
Metacarpals	= hand
Metatarsal	= foot
Patella	= knee
Phalanges	= toes
Phalanges	= fingers
Radius	= lower arm
Scapula	= shoulder
Vertebrae	= back
Tarsals	= ankle bones
Tibia	= leg (on inside)

TITLE: Growing A Plant

GRADE LEVEL: 2 - 3

PURPOSE: Students will be able to identify the various parts and functions of plants.

PLAYERS: 2 - 3

MATERIALS: 45 - 2" x 3" blank cards, spinner, pink, green, brown and black felt, felt-tipped markers, construction paper, poster board

PREPARATION: Construct a poster board watering can by referring to the diagrams on the pattern page. Mount the directions on construction paper. Attach them to the back side of the watering can. On the 45 blank cards type the listed questions. Out of felt (see patterns) cut the following: 15 pink flower petals, 9 green leaves, 3 brown stems, and 9 black roots. Construct a poster board spinner wheel by referring to the examples on the pattern page. Mount the answer key on construction paper and place in the "card pocket."

DIRECTIONS: OBJECT: To identify the various parts and functions of plants.

1. Place the ? cards face down in the center. Next to these, place the flower parts.

2. You choose who will go first. The player will pick the top card and answer the question. If you are right (check the answer key), spin the spinner and take that piece to build your plant. If you do not need that piece, your turn is over.

3. In this game, you will build a plant by using the felt pieces. To win, you must be the first player to build a plant that has 3 roots, 3 leaves, 1 stem and 5 flower petals.

4. If the spinner lands on the line, spin again.

5. If you are wrong or cannot answer the question, you lose your turn.

6. Put the question card on the bottom of the pile.

CARD QUESTIONS

1. Trees are plants
-with seeds or
-without seeds.

2. Molds are plants
-with seeds or
-without seeds.

3. Ferns are plants
-with seeds or
-without seeds.

4. A carrot is a plant
-with seeds or
-without seeds.

5. Moss is a plant
-with seeds or
-without seeds.

6. A rose is a plant
-with seeds or
-without seeds.

7. Corn is a plant
-with seeds or
-without seeds.

8. Mushrooms are plants
-with seeds or
-without seeds.

9. A weed is any plant that is growing in a place that it does not belong.
True or False.

10. Grasses are plants
-with seeds or
-without seeds.

11. Shrubs are plants
-with seeds or
-without seeds.

12. Tulips are plants
-with seeds or
-without seeds.

13. Yeasts are plants
-with seeds or
-without seeds.

14. _____ is the first part of a young plant to appear.

15. Which part of a plant takes in water and minerals from the soil?

16. Which part of a plant stores food?

17. Which part of a plant makes the food?

18. Air enters and leaves through what part of a plant?

19. Which part of a plant holds up the leaves to get their sunlight?

20. Which part of the plant carries water and minerals from the leaves, flowers and fruit?

21. Which part of a plant produces the seeds?

22. _____ are the only things that can store energy from the sun.

23. When we eat a carrot, what part of a plant are we eating?

24. When we eat turnips, what part of a plant are we eating?

25. When we eat celery, we are eating what part of a plant?

26. When we eat asparagus, we are eating what part of a plant?

27. When we eat lettuce, we are eating what part of the plant?

28. When we eat cabbage, we are eating what part of a plant?

29. When we eat spinach, we are eating what part of a plant?

30. When we eat beans, we are eating what part of the plant?

31. When we eat a peanut, we are eating what part of a plant?

32. _____ are trees that have leaves shaped like needles.

33. _____ trees usually shed their leaves every fall.

34. Plant stems that grow under the ground are called _____.

35. A plant whose life span is only one season is _____.
-annual
-perennial

36. A plant whose life span is more than two years is _____.
-annual
-perennial

37. When you remove or cut off parts of a plant to help it, you are _____ the plant.

38. The covering of an undeveloped leaf or flower is called a _____.

39. Tubes that take food and water through the leaf are called _____.

40. Which part of the plant anchors the plant in the soil?

41. Sunlight is necessary for the production of _____ in green plants.

42. What is the green coloring in plants called?

43. What part of the air does a plant need to make food?

44. A green plant changes carbon dioxide and water into _____.

45. What is the process called by which green plants make food?

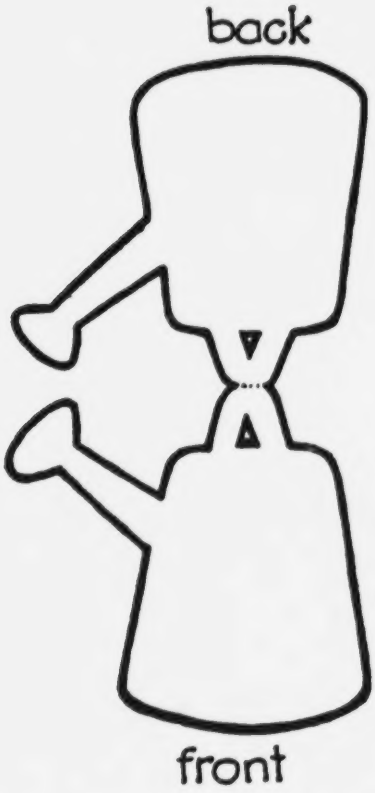
ANSWER KEY

1. with seeds
2. without seeds
3. without seeds
4. with seeds
5. without seeds
6. with seeds
7. with seeds
8. without seeds
9. true
10. with seeds
11. with seeds
12. with seeds
13. without seeds
14. root
15. root
16. root (or some stems like celery)
17. leaf
18. leaf (or stomata)
19. stem
20. stem
21. flower
22. green plants
23. root
24. root
25. stem
26. stem
27. leaves
28. leaves
29. leaves
30. seed
31. seed
32. conifers (i.e. pine trees)
33. deciduous
34. runners
35. annual
36. perennial
37. pruning
38. bud
39. vein
40. root
41. chlorophyll
42. chlorophyll
43. carbon dioxide
44. sugar
45. photosynthesis

Patterns

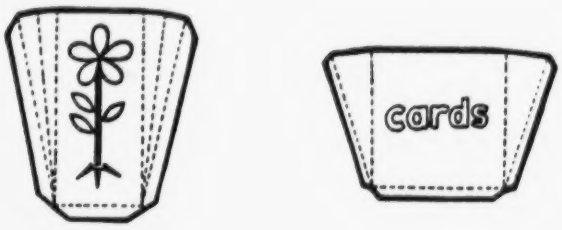
Watering Can

1. Enlarge the watering can pattern on poster board and cut it out.

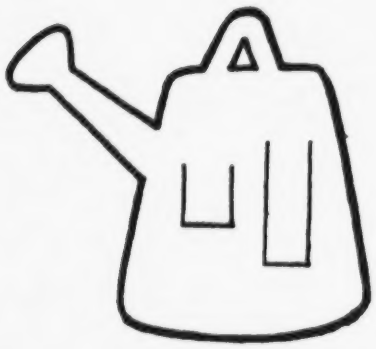


2. Draw the details on the front of the can as shown below.

3. Cut out and detail the pocket patterns as shown. Fold on the dotted lines.



4. On the inside back section, make slits to insert pockets.

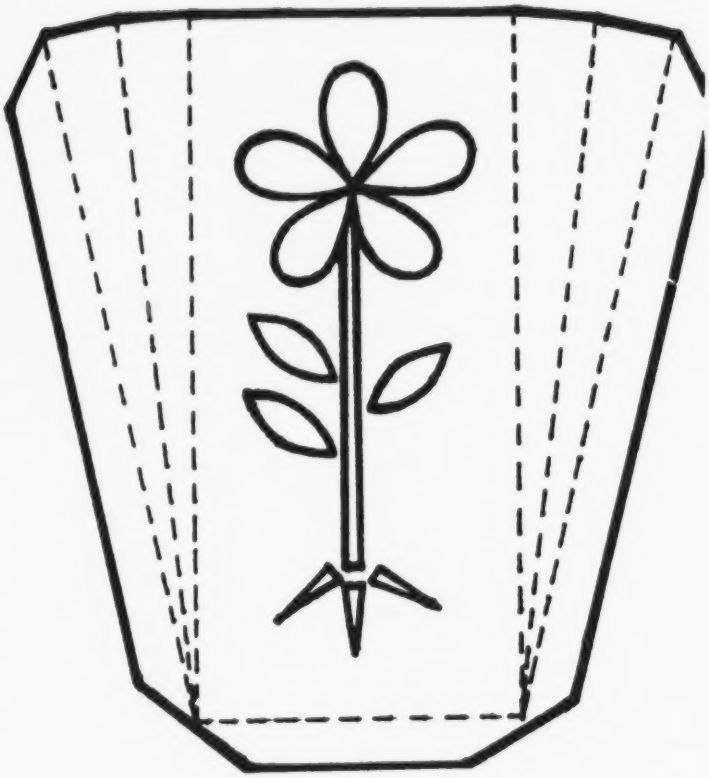


NOTE: Laminate before assembling.

5. Glue the pockets into place.

6. Attach the spinner with velcro to the front inside section.

Patterns



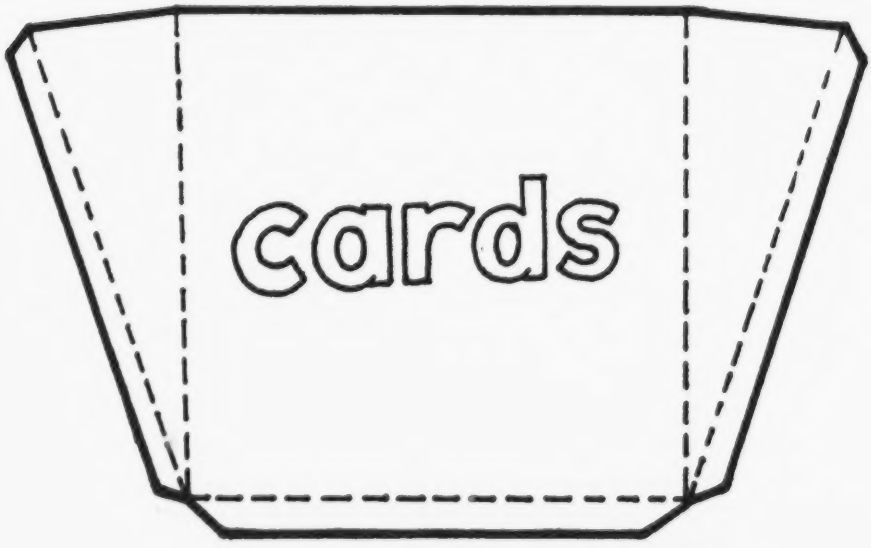
pocket

leaf

stem

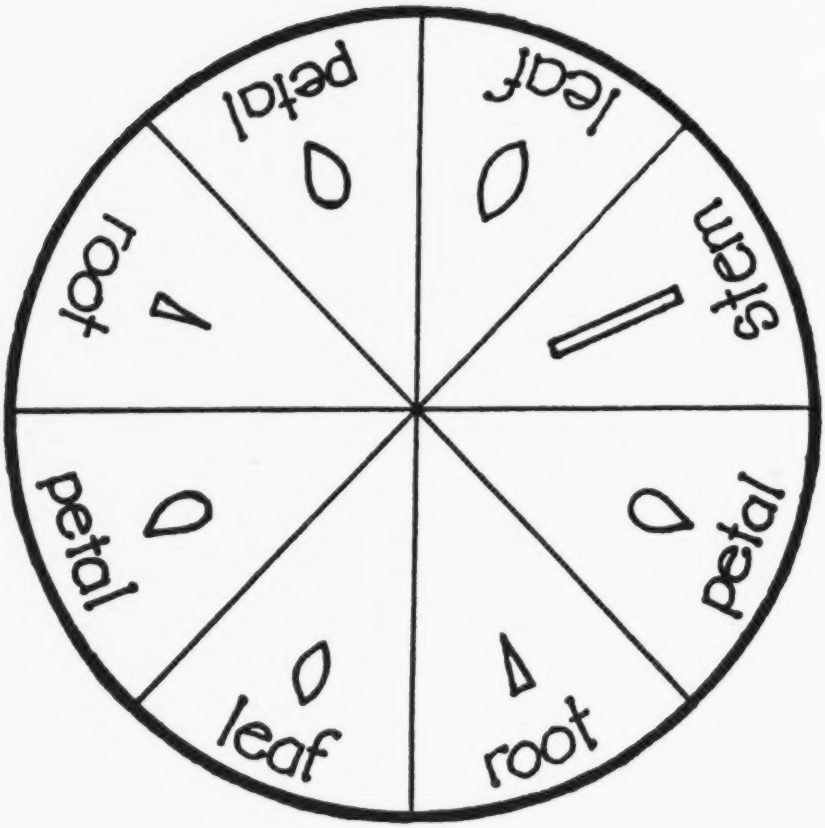
root

petal



pocket

Patterns



spinner

TITLE: Fur or Feathers

GRADE LEVEL: 1 - 3

PURPOSE: The students will learn to distinguish between two of the natural coverings of animals (fur or feathers).

PLAYERS: 2 - 4

MATERIALS: Felt drawstring pouch for container, construction paper, 22 - 3" x 6" poster board cards, felt-tipped markers

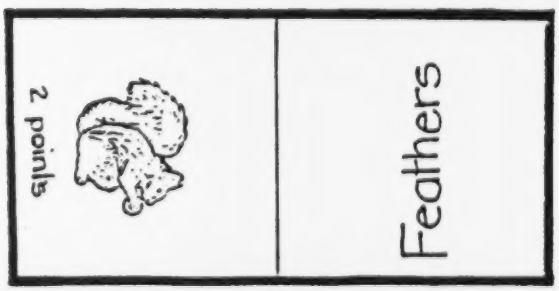
PREPARATION: Mount the card patterns on poster board and cut out. Label the picture and assign it points from 1 to 5. Mount the directions and answer key on construction paper.

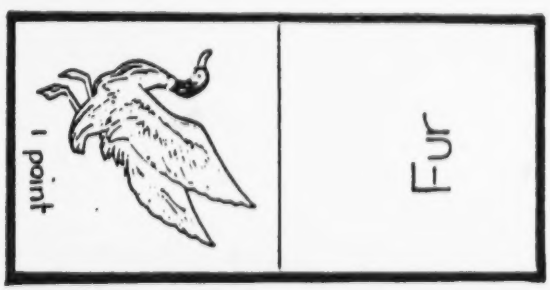
Answer Sheet

Fur	Feathers
bear	bluebird
chipmunk	duck
fox	eagle
lion	hawk
mole	hen
puppy	snowy owl
rabbit	ostrich
raccoon	owl
skunk	rooster
squirrel	turkey
woodchuck	vulture

DIRECTIONS: OBJECT: To match the word FUR or FEATHERS to the picture of the correct animal.

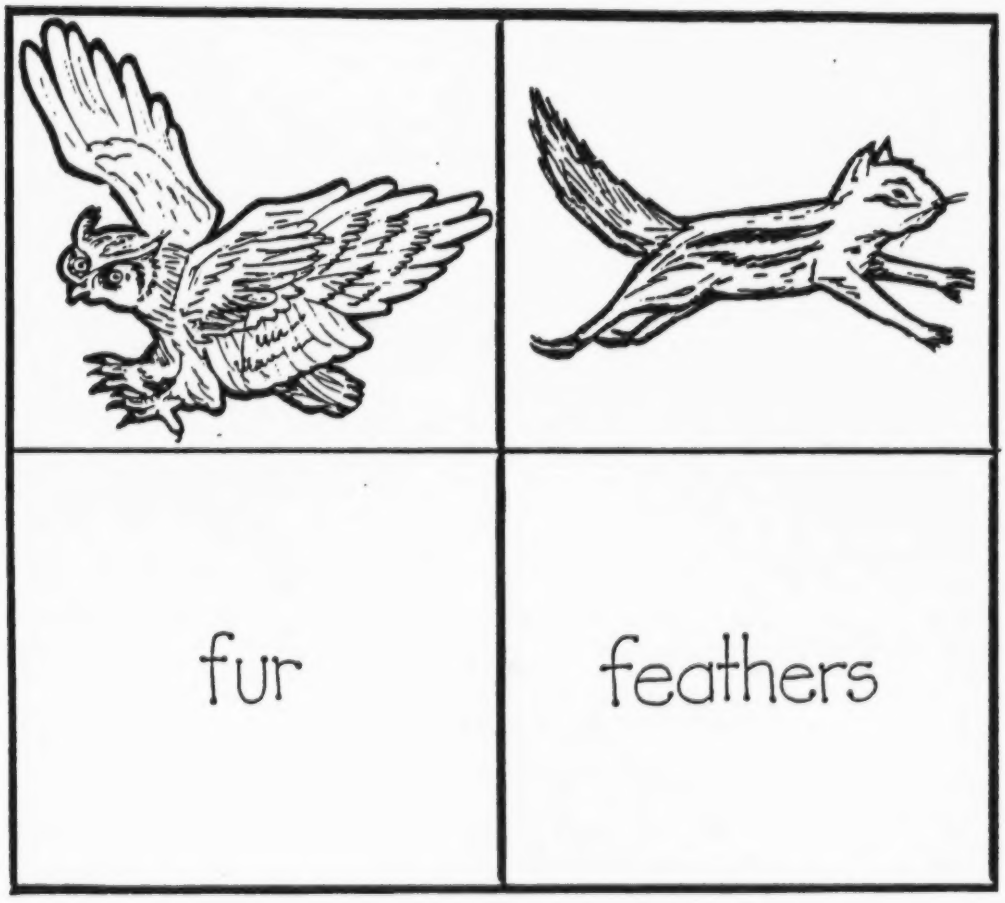
1. Shuffle the cards.
2. Deal out all of the cards face down to each player.
3. The oldest player begins play by putting out a card face up. The next player, to his right, tries to match either <u>end</u> of the first card. You may only lay down one card.

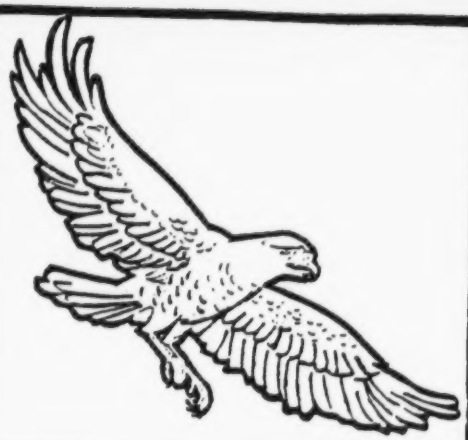




4. For each right answer, the player gets the points on the card he laid down. Check the answer key if needed. Keep track of your points on a piece of paper.

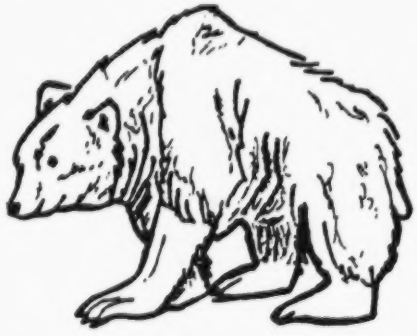
5. The person with the most points at the end of the game is the winner!





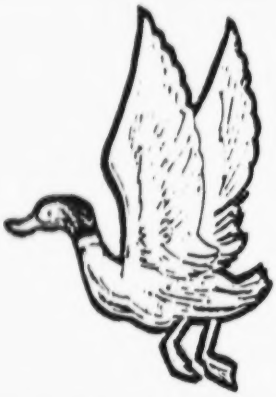
fur

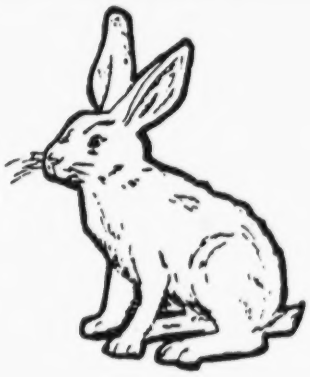
feathers



fur

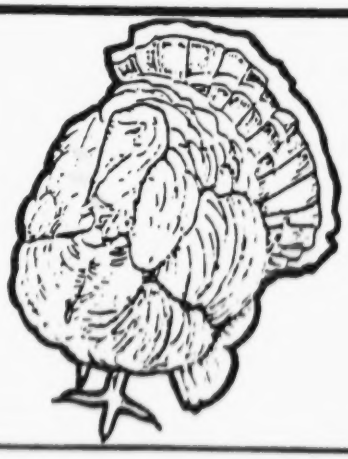
feathers

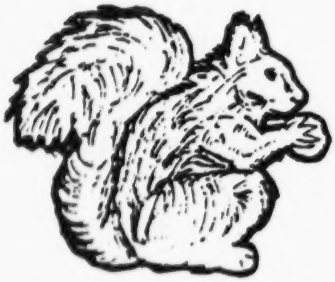




fur

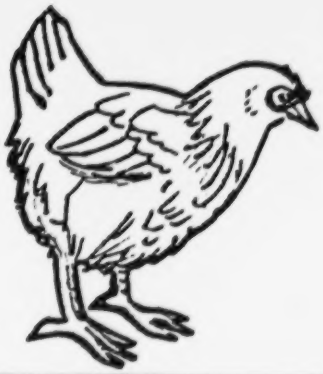
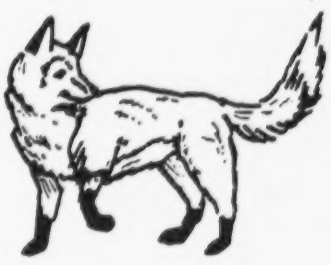
feathers





fur

feathers

	
fur	feathers
	
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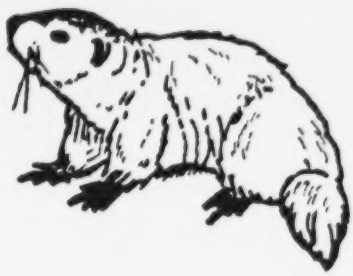


fur

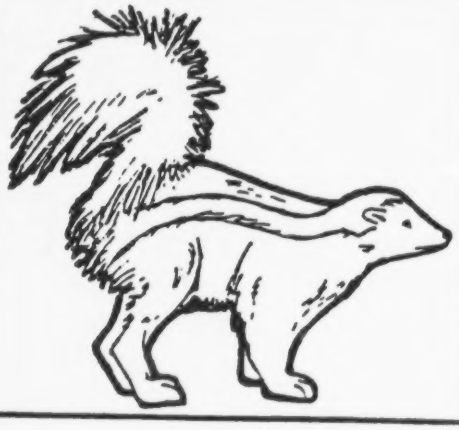
feathers

fur

feathers

fur

feathers



fur

feathers

TITLE: May the Magnetic Force Be With You

GRADE LEVEL: 1 - 3

PURPOSE: The students will have practice distinguishing between magnetic and nonmagnetic materials.

PLAYERS: 2 - 4

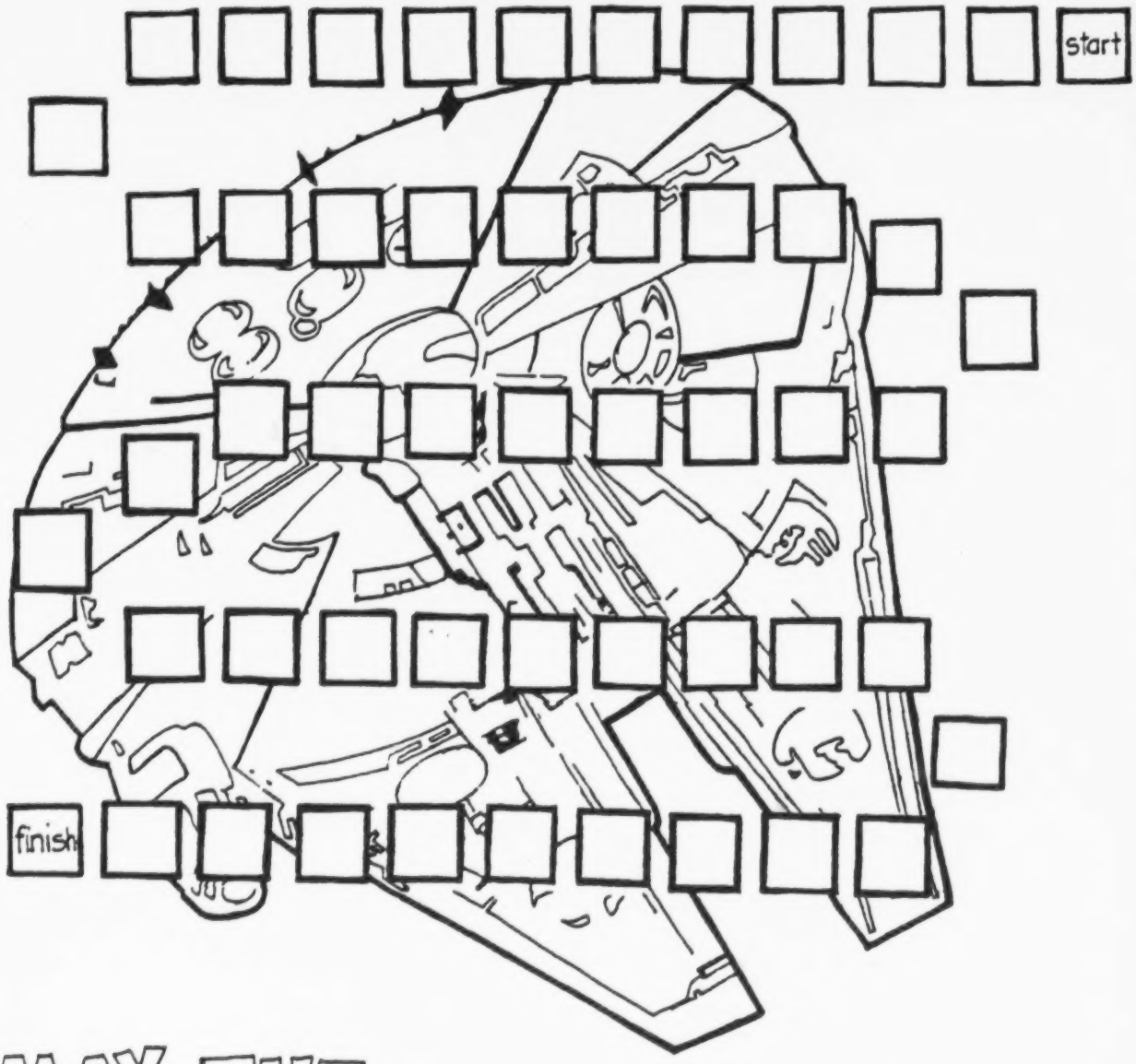
MATERIALS: Poster board, tacky glue, construction paper, 50 small objects (about 35 magnetic), 4 playing pieces, 4 small magnets, spinner, wide felt-tipped marker, space ship picture

PREPARATION: Using the overhead or opaque projector, enlarge and trace the space ship picture to fill 3/4 of the poster board. Glue the fifty small objects to the board on the trail pattern in random order. Make the six space spinner on the board as shown in the pattern. Mount the directions on construction paper. Glue magnets to the bottom of the playing pieces.

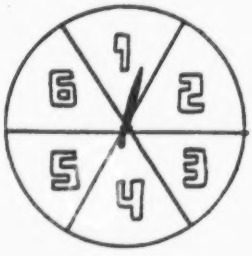
DIRECTIONS: OBJECT: To predict which objects a magnet attracts.

1. Each player must choose a magnetic marker.
2. Take turns spinning the spinner. The player that spins the largest number goes first.
3. Spin the spinner. If the spinner lands on a line, spin again. Before you can move ahead that number of spaces, you must predict if your magnetic marker will be attracted to the object on the square. After you have made your decision, move ahead that number of spaces. If you are correct, you stay there, If not, you must go back to where you were before, and it is the next player's turn.
4. Play continues in this manner until someone has reached "finish." You must spin the exact number to land on "finish."
5. The first player to reach "finish" is the winner.

Gameboard



MAY THE MAGNETIC FORCE BE WITH YOU!



TITLE: Bright Ideas

GRADE LEVEL: 4 - 6

PURPOSE: The student will be able to match general electric terms to their definitions.

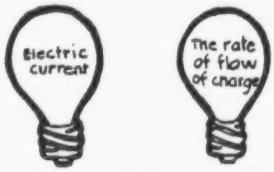
PLAYERS: 2 - 3

MATERIALS: Yellow construction paper

PREPARATION: Using the pattern, cut 32 "light bulbs" out of yellow construction paper. On 16 of the light bulbs type one of the general electric terms. On the other 16 light bulbs, type one of the definitions. Use the answer sheet for this information. Xerox the directions and the answer sheet. Mount both of these on a separate piece of yellow construction paper.

DIRECTIONS: OBJECT: To match general electric terms to their definitions.

1. Spread all the cards on the table face up.
2. The person with the shortest name goes first.
3. Taking turns, players pick up two cards that would match an electric term with its correct definition. For example:



4. You keep this pair of cards.
5. When all of the cards are gone, check the answer key.
6. The player with the most correct matches wins.

BRIGHT IDEAS

Answer Key

Battery - Two or more electric cells connected together.

Circuit - The path through which an electric current flows.

Circuit Breaker - A safety device with a switch that turns off to break the flow of electricity when wires become too hot.

Conductor - A material with charges free to move.

Current Electricity - The movement of electrons.

Dry Cell - A type of electric cell that uses a chemical paste and two kinds of metal to produce a flow of electrons.

Electric Cell - A device that changes chemical energy to electric energy.

Electric Current - The rate of flow of charge.

Electric Motor - A machine that changes electrical energy to mechanical energy.

Hydroelectric Power Plant - A place in which the energy of moving water turns turbines attached to generators that produce electricity.

Insulator - Matter through which an electric current does not flow easily.

Kilowatt-Hour - A unit equal to 1,000 watts of electricity used for 1 hour.

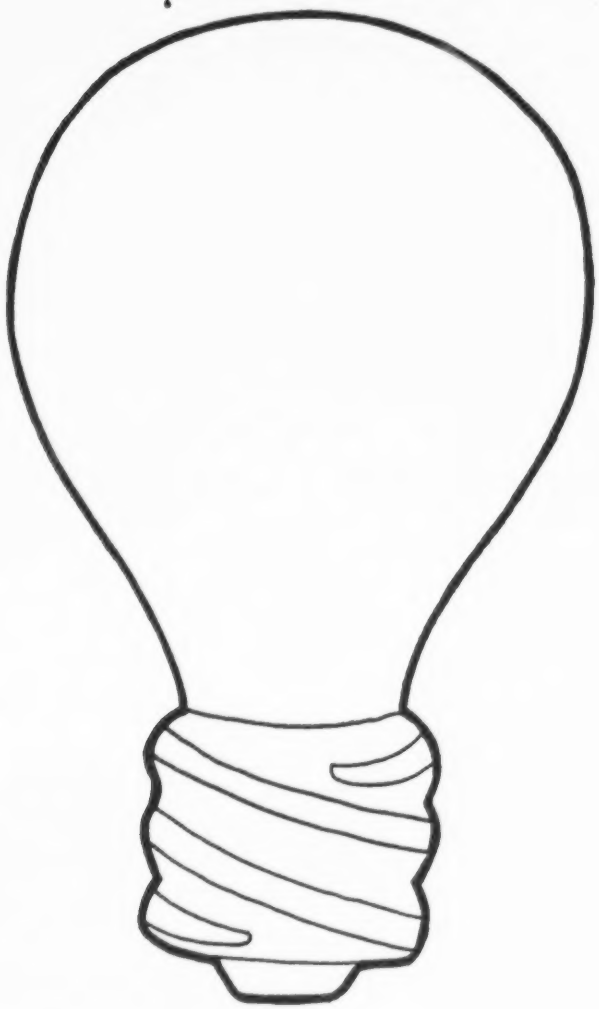
Parallel Circuit - A circuit in which current can follow more than one path.

Series Circuit - A circuit in which current can follow only one path.

Watt - A unit of measure of small amounts of electric power.

Wet Cell - A type of electric cell that uses acid and water which react with metal plates to produce a flow of electrons.

light bulb pattern



TITLE: Chem Clip

GRADE LEVEL: 6 - 8

PURPOSE: The student will be able to match the specific chemical formulas and symbols with the element and compound names.

PLAYERS: 2 players and 1 judge

MATERIALS: 16 clothespins, construction paper, black marker, poster board, zip-lock bag.

PREPARATION: From the poster board, cut a 9" circle. Divide one side into 16 even sections. Put the following compound names (1-12), element names (13-16) and numbers in each section (pattern included):

1. Sodium Hydroxide
2. Hydrocloric Acid
3. Sodium Chloride
4. Dihydrogen Oxide
5. Silver Bromide
6. Magnesium Oxide
7. Carbon Dioxide
8. Barium Sulfate
9. Hydrogen Peroxide
10. Methane
11. Potasium Iodine
12. Calcium Chloride
13. Gold
14. Mercury
15. Lead
16. Copper

On each clothespin write these formulas (1-12) and chemical symbols (13-16): (Do not include the numbers.)

1. NaOH
2. HCL
3. NaCL
4. H_2O
5. AgBr
6. Mg_2O_2
7. CO_2
8. $BaSO_4$
9. H_2O_2
10. CH_4
11. KI
12. $CaCL_2$
13. Au
14. Hg
15. Pb
16. Cu

Put the clothespins in a zip-lock bag. Mount the above list (formulas and chemical symbols) on construction paper to use as an answer key. Mount the directions on construction paper.

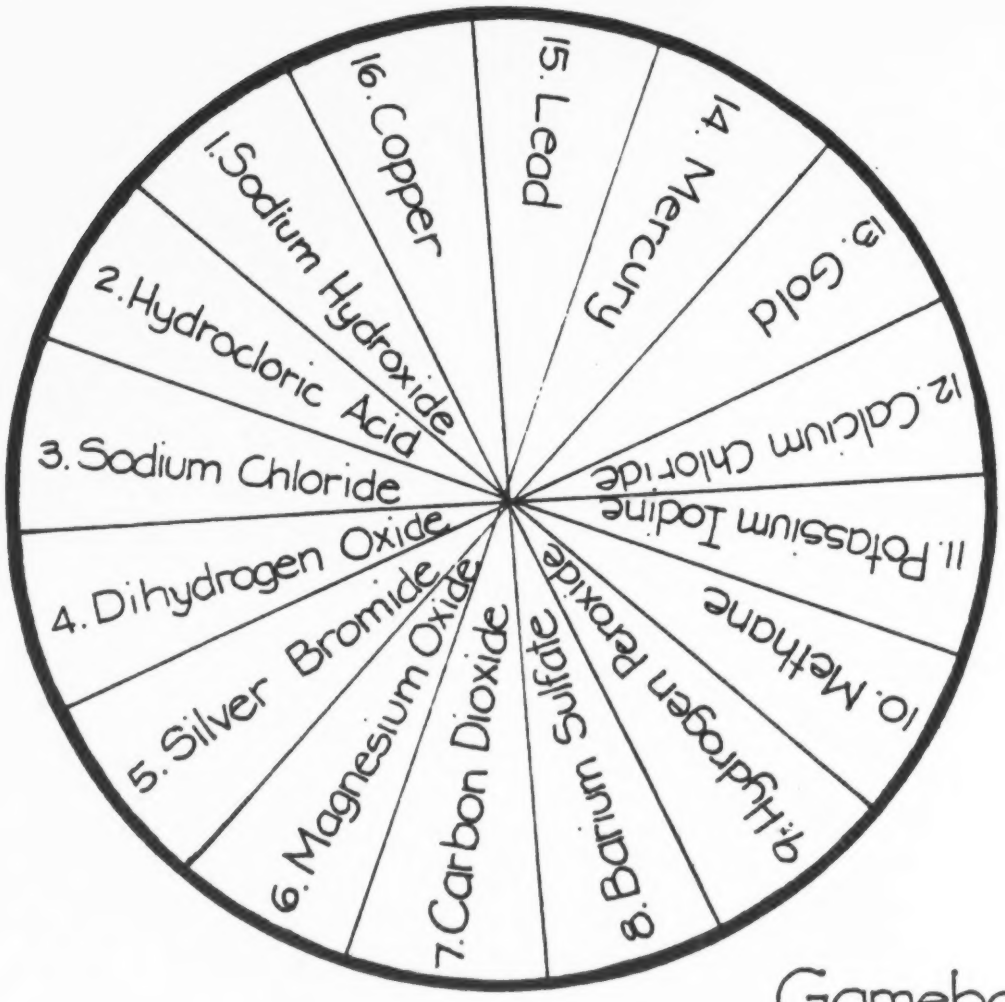
DIRECTIONS: OBJECT: To match the specific chemical formula and symbols with the element and compound names.

1. The person with the longest name goes first.
2. Take turns drawing a clothespin from the bag without looking. Read the chemical symbol or formula on the clothespin and clip it on the wheel where its chemical name is.

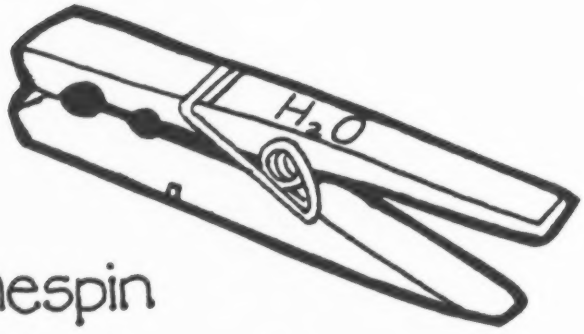
3. The judge will check each match with the answer key.

4. If you are right, leave the clothespin on the wheel. If not, put it back in the bag.

5. On a piece of paper, the judge will keep track of how many you get right. The person with the most correct matches is the winner!



Gameboard



clothespin

TITLE: Solar System Shuttle

GRADE LEVEL: 5 - 8

PURPOSE: The students will identify the names and the order of the planets.

PLAYERS: 2 - 4

MATERIALS: Construction paper, 3" x 5" unlined index cards, crayons, felt-tipped markers

PREPARATION: Xerox seven copies of the planet patterns. Color the planets according to the following list:

Mercury - (rocky) white
Venus - blue and white
Earth - blue and white
Mars - (rocky) red
Jupiter - orange and white
Saturn - yellow and white
Uranus - (smooth) green
Neptune - (smooth) blue-green
Pluto - (smooth) white

Cut the planets out including the names. Mount each one of these on an index card. You will have seven sets of the solar system or seventy cards total. Label the back of these cards "Pass." Mount the directions and four answer keys separately on construction paper.

DIRECTIONS: Select Journey 1, 2, or 3 to play.

Journey 1: Collect one pass from each planet and the sun.

OBJECT: To identify the planets and the names of the planets.

1. The player that is the oldest will shuffle the passes and deal ten to each player. The rest of the passes are to be placed face down in a pile. You may look at your cards. The player to the left of the dealer will be first.

2. The first player draws a pass from the pile. If he already has that pass, he may return it to the bottom of the pile. If he keeps the pass, he discards another.

3. The players take turns drawing passes and discarding.

4. The first player to have a pass from each planet and the sun calls out "blast off" and is the winner of the journey.

Journey 2: Collect 5 passes from 2 planets.

OBJECT: To identify the planets and the names of the planets.

1. The player who is the tallest is the dealer. He shuffles the passes and deals ten to each player. The rest of the passes are to be placed face down in a pile.

2. Players draw passes and discard as in Journey 1, but this time you are to choose two planets to explore and collect five passes from each planet. Ex. You could choose Mercury and Earth. Collect five passes from Mercury and five passes from Earth.

3. You may at any time change your mind and choose other planets to collect.

4. The first player to get two sets of five passes calls "blast off" and wins the journey.

Journey 3: The players are to build solar systems from the cards in their hand.

OBJECT: To identify the order of the planets from the sun.

1. Choose who will be dealer. He shuffles the passes and deals ten to each player. The rest of the passes are to be placed face down in a pile.

2. The first player draws a pass from the pile. If this player has a sun in his hand, he will lay this pass down face up in the middle of the table. This is the start of a solar system. Each time a pass is put down, they must go in the order of the closest planet to the farthest planet from the sun. Ex. Mercury must be played on the top of the sun.

3. Each player must discard on each turn.

4. The next player draws a pass from the pile. He can either play a Mercury on the sun that is there or start a new solar system by laying down another sun. If he does not have a pass in his hand that he can play, he says "pass." He must discard. His turn is over.

5. Any player may play as many passes in each turn as he can on the solar systems on the table.

6. Continue building solar systems by playing passes on top of each other until all ten passes for a solar system are in a stack. There can be up to seven solar system stacks.

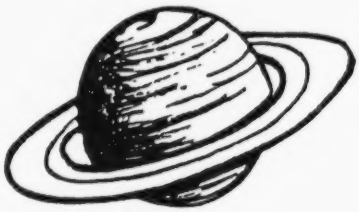
7. Remove each complete solar system stack as they are finished.

8. The first player to get rid of all his passes calls "blast off" and wins Journey 3.

ANSWER KEY:
Sun
Mercury
Venus
Earth
Mars
Jupiter
Saturn
Uranus
Neptune
Pluto

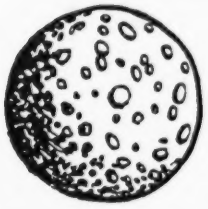
Planet patterns

Jupiter



Saturn

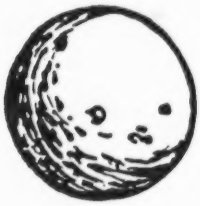
Uranus



Mercury

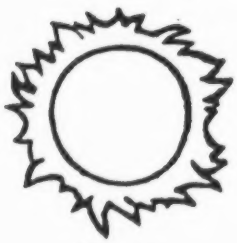
Venus

Earth

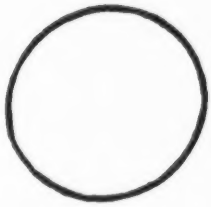


Mars

Neptune



Sun



Pluto

TITLE: Spaced Out Tic Tac Toe

GRADE LEVEL: 6 - 8

PURPOSE: The students will identify general astronomy facts.

PLAYERS: 2 players or 2 teams of 2 - 3 players each

MATERIALS: Construction paper, egg timer, 10 "space" stickers, felt-tipped markers

PREPARATION: Mount the directions and the example card on construction paper. Cut 61 - 3" x 3" cards out of the construction paper. Prepare the given number of cards in the following manner:

5 - write a large X on one side.
5 - write a large O on one side.
10 - place space stickers on one side.
41 - write "Question Card" on one side and a question from the list below. On the other side, write the answer to the question.

The name of the Englishman who discovered the law of gravitation. (Sir Isaac Newton)

Sputnik II carried a dog named Laika. True or False. (True)

Distances in space are often measured in _____. (light years)

_____ on the Earth mostly are caused by the gravitational attraction between the Earth and the Moon. You would see this if you were on a beach. (tides)

This planet's diameter is 9.5 times that of the Earth and has the lowest density of any planet. (Saturn)

December 21st is the shortest day of the year. True or false. (True, it is the date of the Winter Solstice.

The brightest planet in the solar system which is known as the evening star. It is also the name of the goddess of love. (Venus)

A famous characteristic of this planet is its Red Spot - it is also the largest planet in the solar system. (Jupiter)

It takes 20 hours for the Earth to rotate once. True or false. (False, it takes 24 hours)

What is the Russian word for astronaut? (cosmonaut)

Ancient Chinese people thought a huge dragon was trying to swallow the sun when this event took place. (a solar eclipse)

Seen from space, the Earth appears blue and white. What is actually being seen that makes it look these two colors? (Liquid water and water vapor or water and clouds)

A typical astronaut dinner consists of shrimp cocktail, spaghetti and butterscotch pudding served out of plastic bags. True or false. (True)

Neil Armstrong and "Buzz" Aldrin were the first men to do what? (Walk on the moon)

What is the name of our galaxy? (The Milky Way)

A group of bright stars that make a pattern in the sky is called a _____. (Constellation)

What is the layer of air surrounding the Earth called? (The atmosphere)

An instrument for observing distant objects, such as the stars and planets. (Telescope)

The path the moon follows around the Earth is called an _____. (Orbit)

The imaginary line around which the Earth turns is called its _____. (Axis)

Which planet takes 365 days to make the journey around the Sun? (Earth)

The changing shape of the lighted part of the moon that can be seen from the Earth is called the moon's _____. (Phases)

A large group of stars that are often so far away that each group may look like a single star is called _____. (Galaxy)

People who study the sky and stars are called <u>astrologers</u>, <u>astronomers</u> or <u>archaeologists</u>. Choose one answer. (Astronomers)

Scientists have found evidence of <u>water</u> or <u>lava</u> on the moon. Choose one answer. (Lava)

Meteors are also known as shooting stars. True or false. (True)

What is the solid portion of the Earth called? (Geosphere)

What is the outermost layer of a terrestrial planet called? (Crust)

What are a pair of stars in orbit around each other called? (Binary Star)

What is the push or pull that causes a body to change its state of motion called? (A force)

What is the study of the interactions of living things with their environment called? (Ecology)

What is the outermost portion of the sun's atmosphere called? (Corona)

What is the outermost gaseous layer surrounding a planet or star called? (Atmosphere)

What is the gaseous envelope immediately surrounding the nucleus of a comet called? (Coma)

The sun orbits (travels in a path) around out planet Earth. True or False. (False, Earth orbits around the sun.)

He had a comet named after him. It is seen every 75.5 years. (Edmund Halley)

This planet is known as the red planet because there are large amounts of iron-rich clay minerals (80%). Viking I and II landed and took samples of the soil. (Mars)

The name of the star that gives the Earth light. (Sun)

The largest known crater made by a meteorite is found in Arizona. True or false. (True)

DIRECTIONS: OBJECT: To identify general astronomy facts.

Read all directions 1 - 12 before starting play.

1. Place 9 question cards question side up in 3 rows of 3 so that it looks like a TIC TAC TOE box. (See example)

2. Cover each question card with a picture card so that you can't see the questions.

3. Keep the extra cards in a pile for use later. Place a picture card on top of this pile, too.

4. The youngest person with use the "X" cards, the oldest will use the "O" cards.

5. The "X" person starts the first game by choosing a box. (Take turns being first after this game.)

6. Turn the timer over and lift the picture card off the box that is chosen and answer the question. Turn the question card over to check the answer. If you haven't answered the question when the time is up, you lose your turn.

7. If your answer is correct, place an "X" card on that square and remove the picture card. Your turn is over.

8. If your answer is incorrect, remove that question card and put the first question card from the extra card pile in its place. (Keep these cards separate from the extra card pile.)

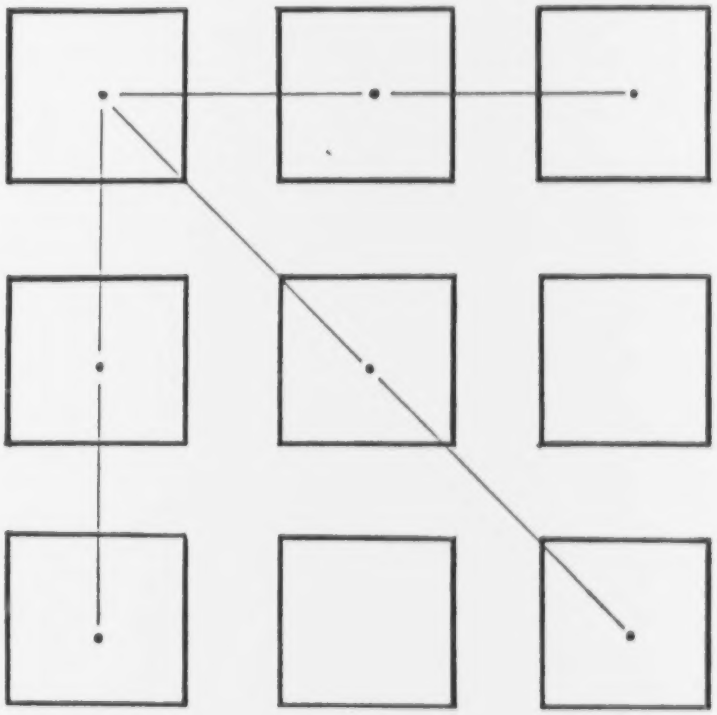
9. Now cover the new question card with the picture card.

10. Continue to play until someone has 3 in a row OR someone ends up with 5 squares covered. Keep score on a separate piece of paper. You get 10 points for each game you win.

11. When someone wins, collect the cards and make a discard pile. Lay down 9 more question cards. Continue to play until you are out of question cards.

12. The person or team who has the most points wins SPACED OUT TIC TAC TOE.

Example Card



You can get Tic Tac Toe in three different ways:

- 3 across
- 3 down
- 3 diagonally

TITLE: Clouds

GRADE LEVEL: 5 - 8

PURPOSE: The student will learn to identify cloud names and attributes.

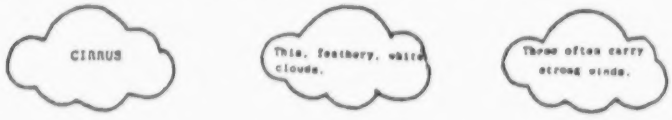
PLAYERS: 2 - 4

MATERIALS: White and blue construction paper, felt-tipped markers

PREPARATION: Using the "cloud pattern" and construction paper, cut out 36 cloud cards. On 24 of the cards, write a fact as listed in the answer key. On the 12 remaining cards, write a cloud name. You will have two sets of the six cloud names. Mount the directions and four answer keys on construction paper.

DIRECTIONS: OBJECT: To identify cloud names and attributes.

1. The oldest player will be the dealer.
2. Shuffle the cards and deal all of them out face down to the players. Place the cards in your hand.
3. The players check for "books" of cards. A book is 1 card with the name of a type of cloud plus 2 cards describing it. You can only use these 3 cards for a book. Two books can be made from each cloud name. You may check your answer key to see if you are correct. Lay the book down on the table face up. Once a book is laid down, you may not add any more cards.



4. The person to the left of the dealer plays first. He chooses one card from the player's hand to his left (without looking at that player's cards). Check your hand to see if you now have a book. If you do, lay it down. Your turn is over.
5. Take turns picking from each other's hands in this way.
6. When one player is out of cards in his hand, play stops.
7. At this time, the player who has the most books is the winner!

ANSWER KEY

CIRRUS (sĭr' əs):
1. Thin, feathery, white clouds.
2. These may change to cirrostratus clouds in one day, signalling the coming of rain.
3. These often carry strong winds.
4. Sometimes appear as hooked filaments called "mare's tails."

CUMULUS (KYŌŌM' yə ləs):
1. Puffy, cottony cloud of fair-weather days.
2. Form during the day and disappear at night.
3. When conditions are right, they grow tall and become cumulonimbus.
4. Consists of globular individual cloud masses.

NIMBOSTRATUS (nĭm bō STRAT' əs):
1. True rain clouds.
2. Sometimes dark streaks can be seen running from the bottom of the cloud to the ground.
3. The base of the cloud looks dark and wet.
4. Dark gray clouds.

CUMULONIMBUS (KYŌŌM' yə lō nĭm' bəs):
1. Tall, billowy cloud.
2. Signals a thunderstorm - "thunderhead."
3. Formed by strong, vertical wind currents, it may tower 5 miles in the air.
4. Associated with heavy rainfall, thunder, lightning, hail and tornadoes.

CIRROSTRATUS (sĭr' əs STRĂT' əs):
1. Thin, layered cloud that contains ice crystals.
2. Often precedes warm fronts that bring rain.
3. When blown by the wind, it looks like patches of guaze.
4. Sometimes produce halos around the sun or moon.

ALTOSTRATUS (ăl tō STRĂT' əs):
1. Thick and thin layers of gray or blue-gray clouds.
2. Produce an overcast sky.
3. Give the sky a striped or streaked appearance.
4. May produce very light rain.

cloud pattern

TITLE: The Attribute Game

GRADE LEVEL: 2 - 6

PURPOSE: The students will classify the attributes of color and shape through visual discrimination.

PLAYERS: 2 - 4

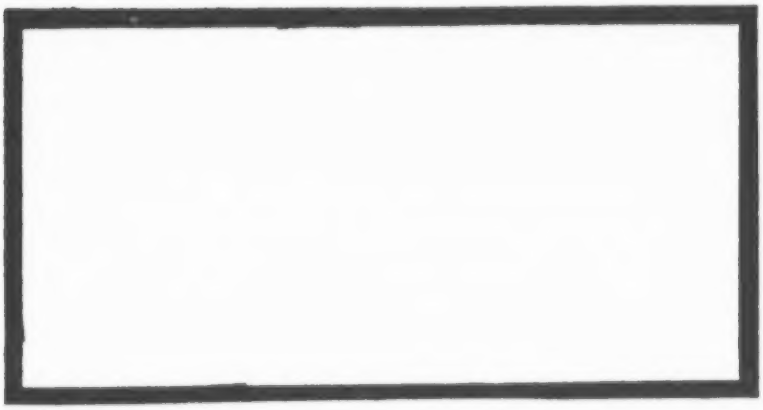
MATERIALS: 2 - 8" x 12" felt squares of 6 different colors, construction paper, 2 blank dice

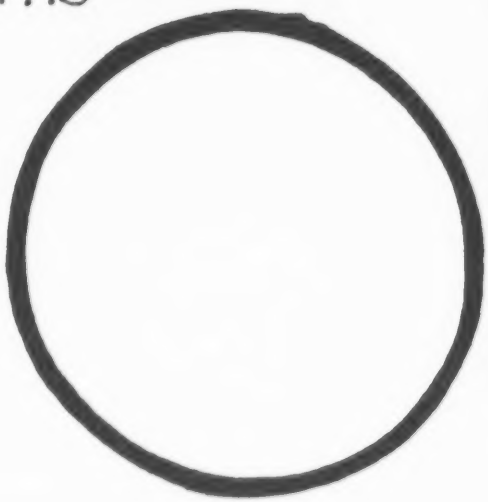
PREPARATION: Cut 1 of each shape out of each felt color. You will have a total of 36 pieces. Color each face on one die to match the felt colors. On the other blank die, draw a different shape on each face. Mount the directions on construction paper

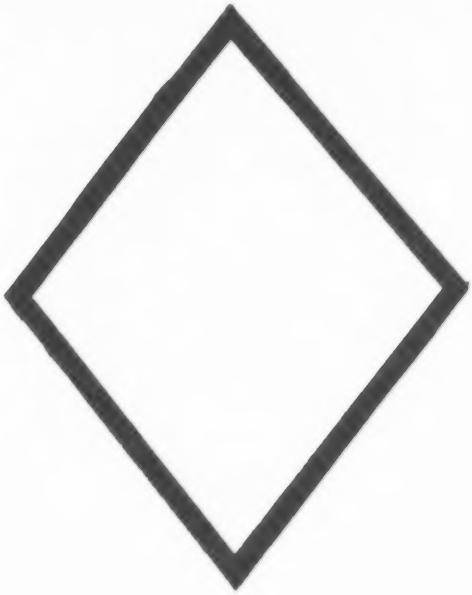
DIRECTIONS: OBJECT: To classify the attributes of color and shape.

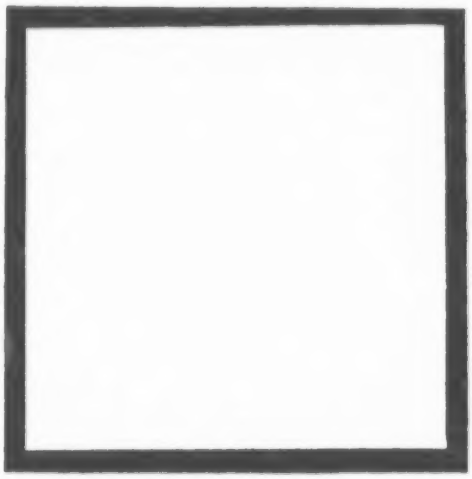
1. Mix the game pieces.
2. Deal 8 pieces to each player. Lay these out in front of you.
3. Put the rest of the game pieces in the center so that you can see them all.
4. Decide on which attribute you will try to collect. (Which shape or color.) For example: all red shapes or all squares.
5. Roll the dice. If the dice show a circle and the color brown, that means that you can look for the brown circle. Find that game piece and take it for your hand. If the game piece is in another player's hand, you take that piece. If you roll a game piece than is in your hand, roll again.
6. You must then discard one of your other game pieces either in the center or the player's hand you just took a game piece from.
7. You will have 8 game pieces in your hand at all times. If you forget to discard a game piece, you lose your next turn.
8. Continue until one player has 5 game pieces that have the same attribute (color or shape). This player is the winner.

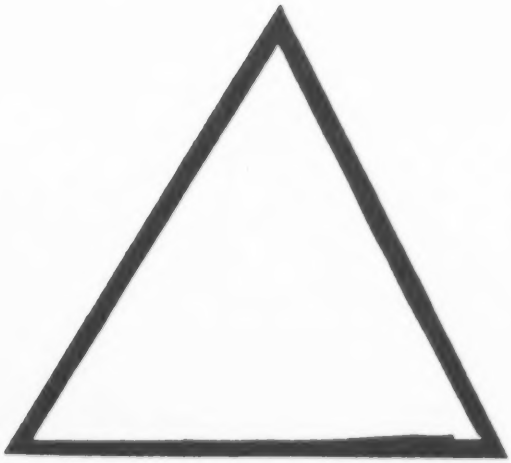
shape patterns











TITLE: Shadows

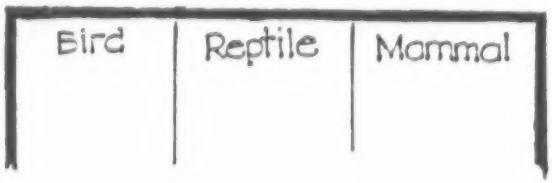
GRADE LEVEL: K - 3

PURPOSE: The students will be able to classify animal silhouettes into Bird, Reptile and Mammal categories.

PLAYERS: 2 - 4

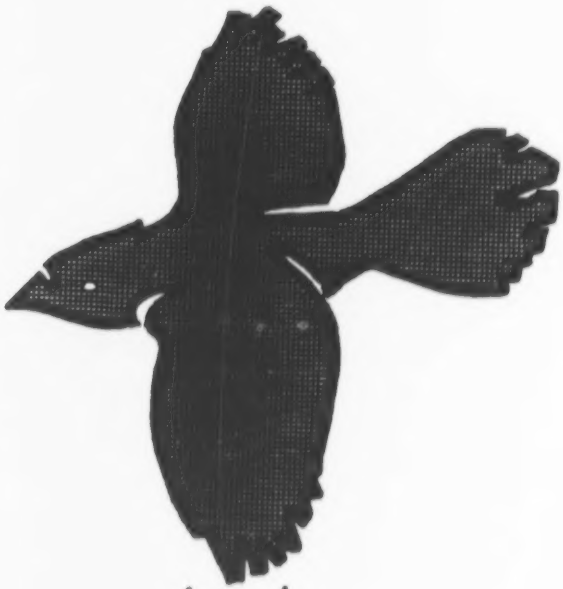
MATERIALS: Poster board, construction paper, 4 different colored grease pencils.

PREPARATION: Mount the animal cards on poster board and cut out. To make the gameboard, divide the 14" by 24" piece of poster board into three even sections and label each section with the word Bird, Reptile or Mammal. Make four scorecards using a whole piece of construction paper for each one. Construct them to look like a small gameboard. Divide the paper into three sections and label each section. On the front side write "Scorecard." Mount the directions on construction paper.

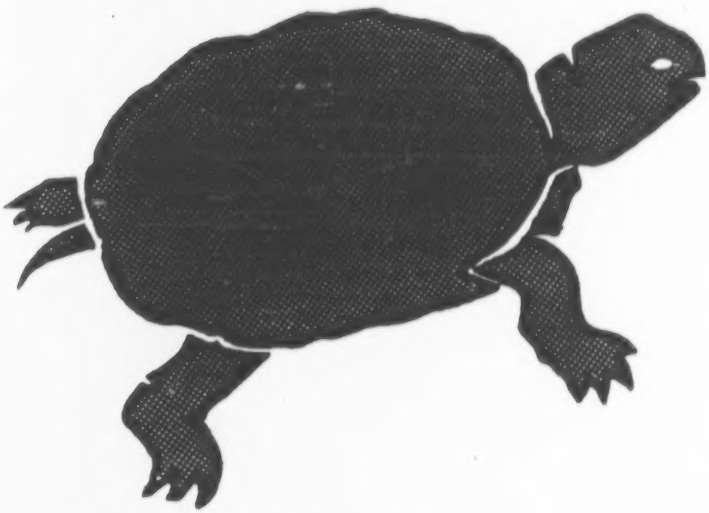


DIRECTIONS: OBJECT: To classify animal silhouettes into bird, reptile and mammal categories.

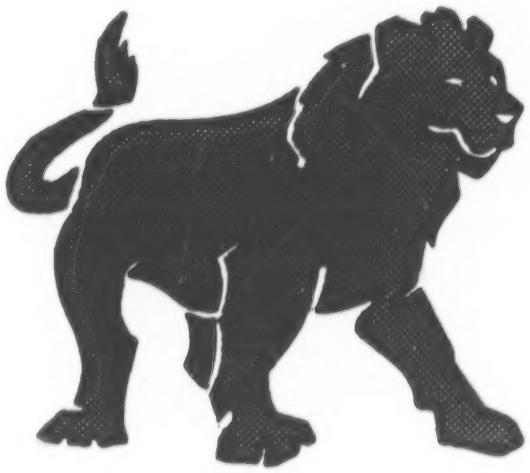
1. Each player chooses a pencil for writing on his scorecard.
2. Deal out all of the animal shadow cards to each player.
3. Take turns putting down a shadow card in the correct column of the gameboard. For example: A duck would go in the bird column.
4. As you play a card, the name of the animal must be written in the correct column of your scorecard.
5. After all the cards have been played, check the answers on the answer sheet.
6. Each player earns two points for putting the animal in the right column.
7. The player with the most points is the winner!



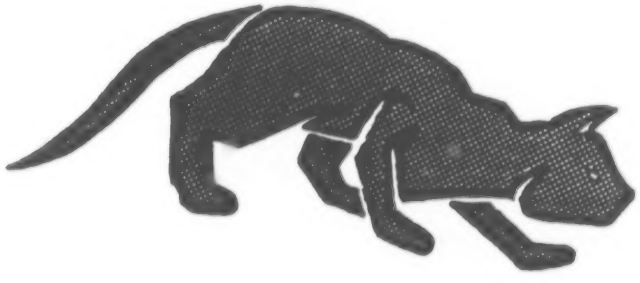
bird



turtle



lion

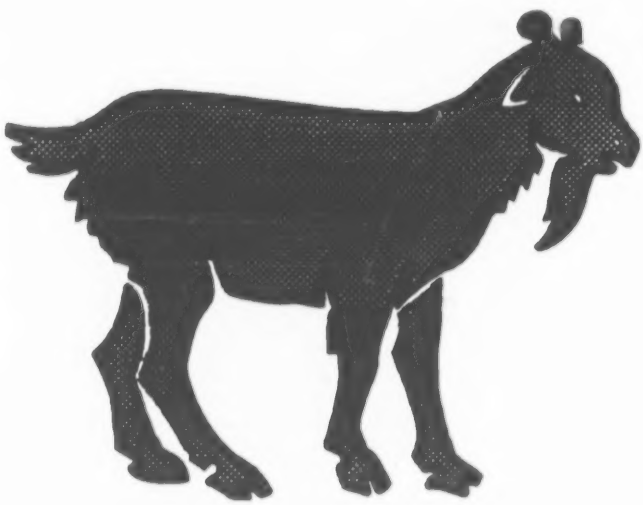


cat

bear

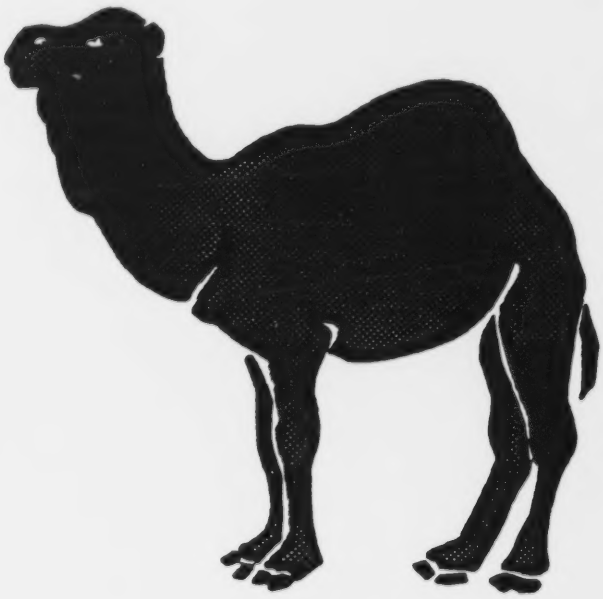
alligator

horse

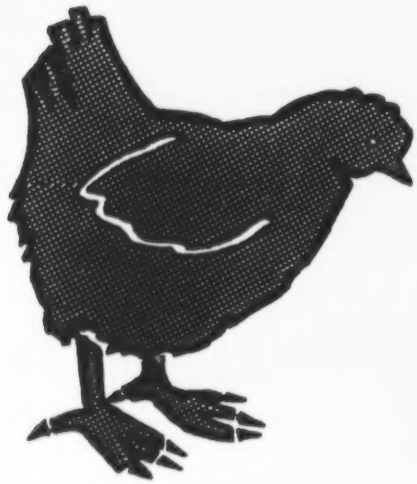


goat

lizard



camel

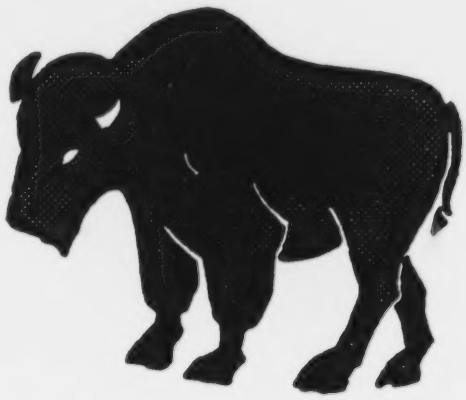


chicken

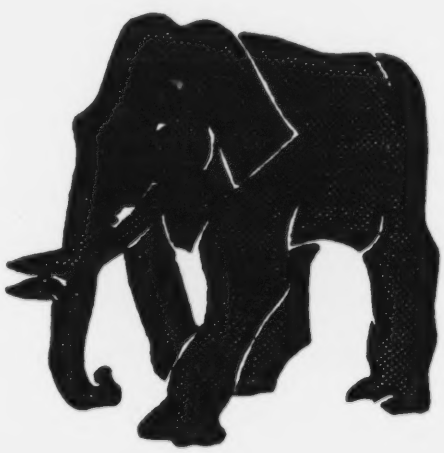
rooster

swan

chick

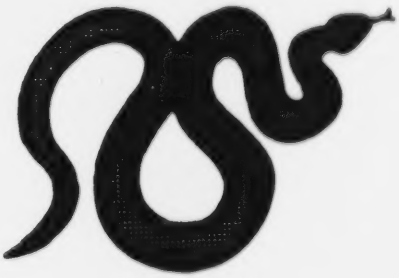


buffalo



elephant

squirrel



snake

lamb

TITLE: Foodopoly

GRADE LEVEL: 3 - 6

PURPOSE: Students will be able to distinguish between the four basic food groups.

PLAYERS: 2 - 4 players

MATERIALS: 20" x 20" piece of poster board, construction paper, felt-tipped markers, food pictures, die, 4 game markers.

PREPARATION: Use an opaque or overhead projector to enlarge and trace the gameboard (see pattern) onto poster board. Cut squares and circles out of construction paper and glue on the appropriate area of the gameboard. Make 29 circle cards and 37 square cards using the patterns. Number the square cards 1 - 37. Label the back of the circle cards, "Chance Card." Label the back of the square cards, "Food Card." Cut pictures of food out of magazines and glue them onto the square (food) cards. Make an answer key according to the pictures you used to make the square (food) cards using the following groups:

Breads & Cereals	Fruits & Vegetables
Meats & Meat Alternatives	Dairy Products

On 9 of the circle (chance) cards, glue pictures of junk food cut from magazines. On the other 20 circle (chance) cards, type the following statements:

You ate too much Halloween candy and have to get 2 teeth filled. Lose 1 turn.
Helped to make a well-balanced dinner. Go forward 1 space.
Ate only french fries for lunch. Lose 1 turn.
You have been eating right. Free turn, roll again.
Forgot to brush you teeth after eating. Go back 1 space.
You didn't eat any fruit or vegetables today. Go back to where you were.
Had a tall glass of milk with lunch. Fo forward 1 space.
Ate breakfast. Good for you! Free turn, roll again.
Ate plenty of the right foods today. Go forward 2 spaces.
Too hot today and you stuffed yourself. Now you are in the Nurse's office. Lose 1 turn.
Didn't eat breakfast before coming to school. Go back to where you were.
Too much junk food. You have a stomach ache. Lose 1 turn.
You ate all your green vegetables at dinner. Good for you! Go forward 2 spaces.
You didn't brush your teeth after dinner. Go back 2 spaces.
Helped your mom pick out fresh fruit at the store. Yum, yum. Go forward 1 space.

Have a nice day! Go forward 1 space.
Ate a candy bar right before you went to bed last night. Shame, shame. Go back 2 spaces.
You ate too much candy and your teeth fell out. Roll the die to see how many spaces you move back.
You ate an apple for your snack instead of a candy bar. Good! Go forward 3 spaces.
You ate a balanced lunch. Go foward 2 spaces.

Mount the directions on construction paper.

DIRECTIONS:

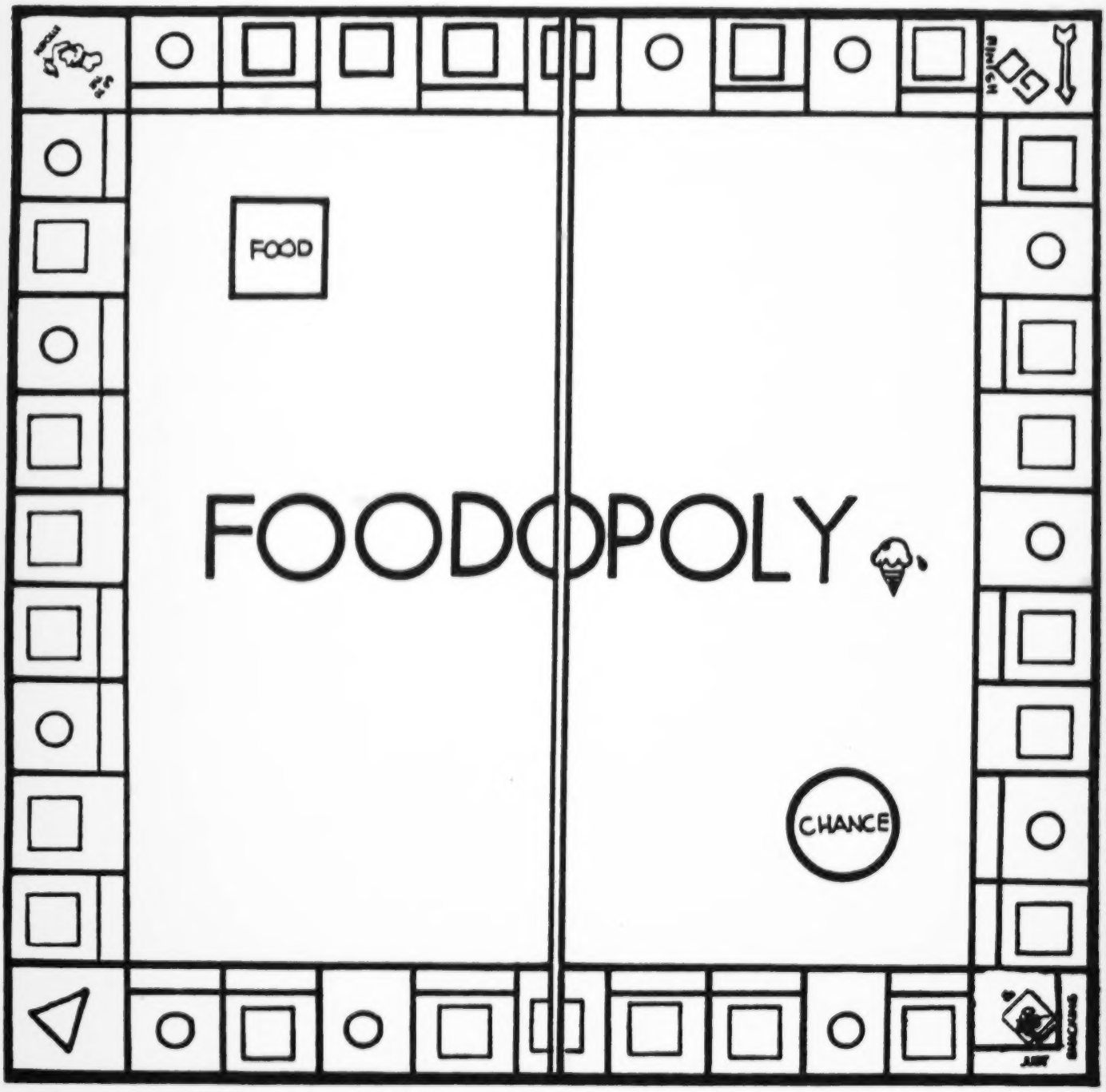
OBJECT: To identify foods in the four basic food groups.

Each player needs a marker. Place the markers on "start." The shortest player is first.

Place these cards on the gameboard in the proper place. Read 1 - 7 before you begin playing the game.

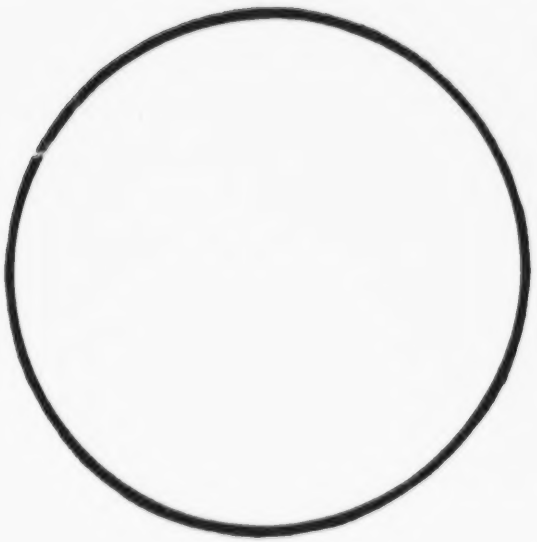
1. Roll the die and move that number of spaces.
2. If you land on a square, draw a square food card. The four food groups are breads & cereals, dairy products, fruits & vegetables, and meats & meat alternatives. If you can name the correct food group that the picture goes in, stay there. If you cannot name the correct group, go back to where you were. Put the card back on the bottom of the pile. Your turn is over.
3. If you land on a circle, draw a circle chance card. If it has a junk food picture on it, you lose a turn. If it has writing on it, follow the directions. If it sends you to another space, you do not draw another card. Your turn is over.
4. If you land on a triangle, your turn is over.
5. If you go to the kitchen, you can get out of the kitchen by rolling a four on the die or by naming the four food groups.
6. The person to the left is next.
7. Play continues until a player gets to the finish. You must roll the exact number in order to land on finish.

Remember: If you have to name a food group and you make a mistake, go back to where you were before. All answers can be checked with the answer sheet.

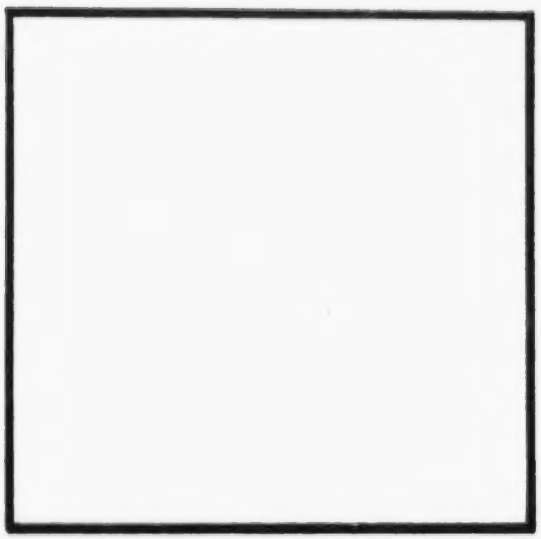


Gameboard

Patterns



chance card



food card

TITLE: Desert Adventure

GRADE LEVEL: 4 - 6

PURPOSE: The students will identify characteristics of the desert environment.

PLAYERS: 2 - 4

MATERIALS: Poster board (18" x 18"), construction paper, four game markers, 3½" x 2" cards - 7 yellow, 7 brown and 49 orange.

PREPARATION: Mount the directions on construction paper. Using an Opaque or overhead projector, enlarge the gameboard onto the poster board. Attach a spinner to the center of the gameboard. On the 3½" x 2" cards prepare the following quantities: 7 yellow cards - Write "Equipment Card" on the front of each card and one of the following terms on the back: jack knife, water purification kit, mirror, first-aid kit, and boots. 7 brown cards - Write "Equipment Card" on the front of each card and one of the following terms on the back: jack knife, mirror, first-aid kit, boots, long-sleeve shirt, water purification kit and solar still. 49 orange cards - Write "Quiz Card" on the front of each card and one of the following question/answer statements on the back:

Desert animals seldom use their front legs. True or false. (False. All desert animals use their front legs like hands.)

Roadrunners do not eat lizards. True or false. (False. They even eat the funny looking horned toad lizards.)

The Buckhorn Branch is the prickliest of the cactus family. True or false. (False. It is the Cholla.)

If you have a shortage of water, you should ration it. True or false. (False. You should drink it when you need it to prevent early dehydration.)

Rattlesnakes always give a warning by rattling their tails before they strike. True or false. (False)

There are at least 12 species of the rattlesnake that inhabit the Western desert of North America. True or false. (True)

Death Valley is above or below sea level. (Below. It is 282 feet below sea level and it is the lowest point in North America.)

The desert tortoise stores _____ inside its upper shell. a. pennies, b. leaves, c. water, d. nuts. (C)

Roadrunners' "X" shaped claws provide traction on the desert sand. True or false. (True)

The Gila Monster stores surplus food in his tail as well as his body. True or false. (True)

The legendary Lost Dutchman's mine was named after a German man called Jacob von Walzer (later called Jacob Walz). True or false. (True)

Cottontail Rabbits are most active in the early morning and late evening. True or false. (True)

In the sunlight the ground usually is _____ degrees hotter than the air. (30)

Bighorn sheep are very aggressive. True or false. (False. They are shy.)

Pepsis or Tarantula Hawk is a hawk that kills tarantulas True or false. (False. Pepsis or Tarantula Hawk is not a hawk but a wasp that stings and drags the huge spider to its nest to feed its young.)

Elf Owls like to perch themselves in the entrance of holes in cacti. True or false. (True)

The roadrunner cannot fly. True or false. (False. He flies low to the ground and only short distances.)

The Chuckwalla is North America's largest lizard. True or false. (False. The Gila Mosnter is North America's largest lizard.)

When hiking in the desert, you should carry at least _____ gallons of water per person per day. (One)

Only one out of every hundred Saguaro cactuses become mature plants. True or false. (False. One out of every 250,000)

The smallest but most dangerous rattlesnake is the Diamondback. True or false. (False. It is the largest and most dangerous rattlesnake.)

The hardiest, most adaptable plant in the cactus family is . . . a. Organ Pipe, b. Barrel Cactus, c. Prickly Pear, d. Hedgehog. (c)

Weather conditions have more seriously decreased the number of Saguaros that overgrazing. True or false. (True)

The Collared Peccary or Javelina is a loner. True or false. (False. It travels in groups.)

Desert bushes have tiny leaves. True or false. (True)

The snake's hard _____ is good for crawling over sharp rocks and sands. (Skin)

Parallel slash marks in the sand is a sign of the . . . a. Jackrabbit b. Sidewinder, c. Javaline, d. Gila Monster. (b)

Do humans lose more water by breathing through their nose or mouth. (Mouth)

The important work of the cactus stem is to store water. True or false. (True)

What cactus is often called the "jumping cactus"? (Cholla)

The leaves of the Creosote bush have no smell. True or false. (False. They have a funny smell.)

The prairie dog lives in a coterie. True or false. (True. A coterie is the family unit that defends its territory.)

Branches of the Palo Verde are brown. True or false. (False. They are green.)

The tadpole shrimp lives out a short life in temporary pools formed by desert rainstorms. True or false. (True)

The Gila Monster eats bird and lizard eggs as well as young birds and rodents. True or false. (True)

Jackrabbits long ears act as radiators for keeping the body cool. True or false. (True)

The painful sting of a scorpion can be fatal to man. True or false. (True)

Coral snakes have small, blunt, black heads. Their venom is very poisonous to man. True or false. (True)

The creature called the Coatimunde (ko at' e-mun' de) is known locally to Arizonans as the Chula, and is a tropical relative of the raccoon. True or False. (True)

The Gila Monster is too sluggish and timid to offer a real threat to humans. True or false. (True)

When the grass had dried up, the Jackrabbit gets its water from cactuses. True or False. (True)

The Supersition Mountains are full of eruptions. True or false. (False. They are composed mostly of igneous materials such as tuff and andesite - dust and ash of ancient volcanic convulsions.)

Can water be purified by boiling. Yes or no. (Yes)

The huge ears of the Black-tailed Jack Rabbit detect the presence of predators at a distance. True or false. (True)

Branches of the Mesquite are green. True or false. (False. They are brown.)

The Gila Monster is a threatened and protected species. True or false. (True)

The Gila Monster is one of the many poisonous lizards. True or false. (False. There are only two poisonous lizards in the world. The other is the Mexican beaded lizard.)

The waxy covering of the desert plant keeps moisture out. True or false. (False. It keeps it in.)

When using iodine tablets to purify water, you should drink the water right away. True or false. (False. Let it stand for thirty minutes.)

DIRECTIONS: OBJECT: To identify characteristics of the desert environment.

1. Place the game cards on the board face down.

2. Each player place your marker on START. Now you are ready to start your desert adventure.

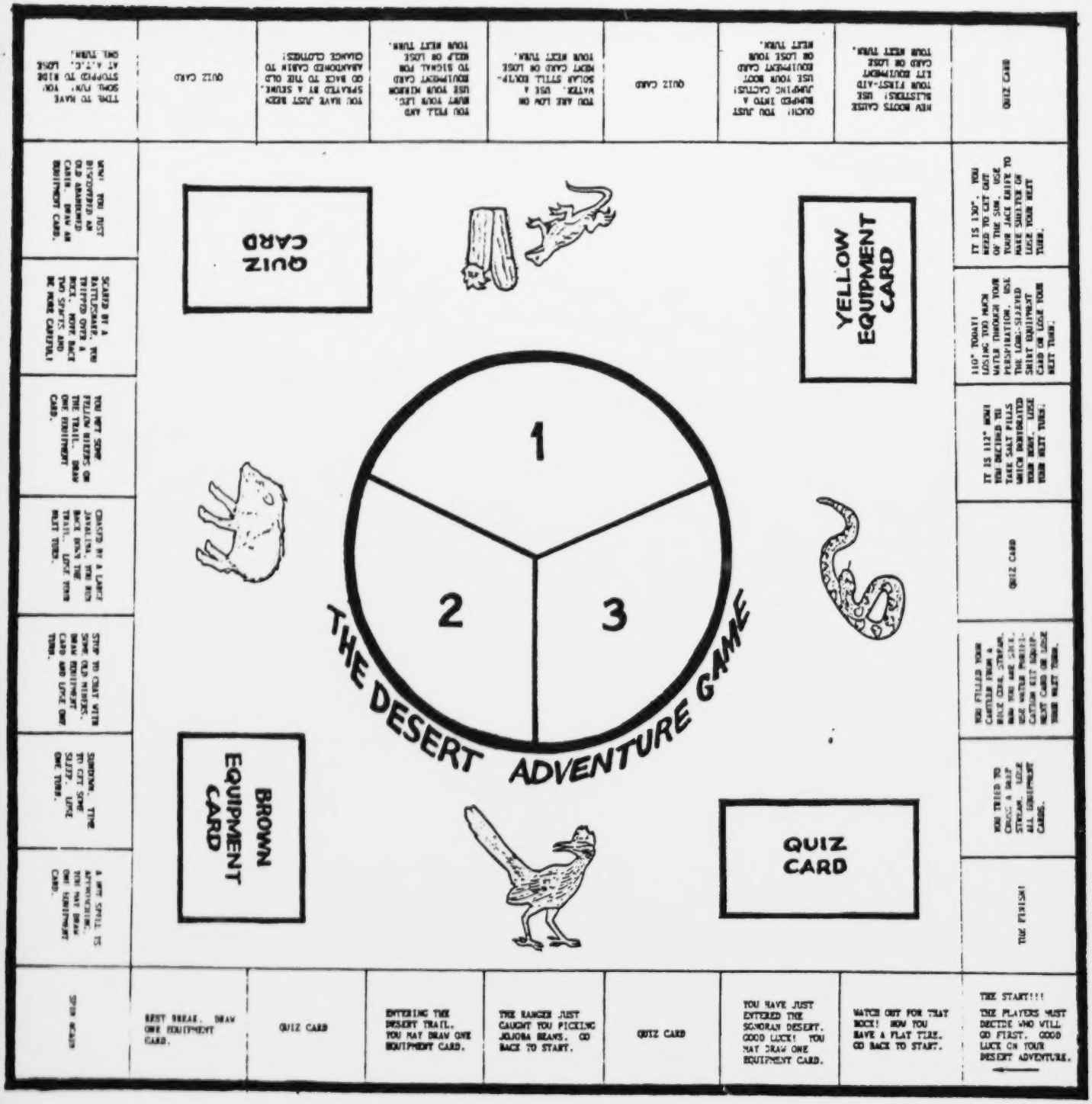
3. Take turns spinning and move that number of spaces. If it lands on a line, spin again.

4. Follow the directions on the space on which you land.

5. When you land on a "Quiz Card" space, draw a Quiz Card. Ask that question to the player to your right. If that player answers the question incorrectly, you spin again. If that player answers correctly, put the card on the bottom of the pile. Your turn is over.

6. If you use an Equipment Card, return the card to the bottom of the pile. Your turn is over.

7. Continue play until someone reaches FINISH. You must roll the exact number you need in order to land on FINISH and win the game.


THE START!!!
THE PLAYERS MUST DECIDE WHO WILL GO FIRST. GOOD LUCK ON YOUR DESERT ADVENTURE.
WATCH OUT FOR THAT ROCK! NOW YOU HAVE A FLAT TIRE. GO BACK TO START.
YOU HAVE JUST ENTERED THE SONORAN DESERT. GOOD LUCK! YOU MAY DRAW ONE EQUIPMENT CARD.
QUIZ CARD
THE RANGER JUST CAUGHT YOU PICKING JOJOBA BEANS. GO BACK TO START.
ENTERING THE DESERT TRAIL. YOU MAY DRAW ONE EQUIPMENT CARD.
QUIZ CARD
REST BREAK. DRAW ONE EQUIPMENT CARD.
STUCK HOUSE
A HOT SPELL IS APPROACHING. YOU MAY DRAW ONE EQUIPMENT CARD.
SUNDOWN. TIME TO GET SOME SLEEP. LOSE ONE TURN.
STOP TO CHAT WITH SOME OLD MINERS. DRAW EQUIPMENT CARD AND LOSE ONE TURN.
CHASED BY A LARGE JAVALINA, YOU RUN BACK DOWN THE TRAIL. LOSE FOUR NEXT TURN.
YOU MET SOME FELLOW RIDERS ON THE TRAIL. DRAW ONE EQUIPMENT CARD.
SCARED BY A RATTLESNAKE, YOU TRIPPED OVER A ROCK. MOVE BACK TWO SPACES AND BE MORE CAREFUL!
WOW! YOU JUST DISCOVERED AN OLD ABANDONED CAVE. DRAW AN EQUIPMENT CARD.
TIME TO MAKE SOME TUV! YOU STOPPED TO RIDE AT A.T.C. LOSE ONE TURN.
QUIZ CARD
YOU HAVE JUST BEEN SPRAYED BY A SKUNK. GO BACK TO THE OLD ABANDONED CABIN TO CLEAN UP!
YOU FELL AND HURT YOUR LEG. USE YOUR MIRROR TO SIGNAL FOR EQUIPMENT CARD HELP OR LOSE TOUR NEXT TURN.
YOU ARE LOW ON WATER. USE A SOLAR STILL FOR NEXT CARD OR LOSE TOUR NEXT TURN.
QUIZ CARD
OUCH! YOU JUST BUMPED INTO A JUMPING CACTUS! USE YOUR BOOT EQUIPMENT CARD OR LOSE TOUR NEXT TURN.
NEW BOOTS CAUSE BLISTERS! USE TOUR FIRST-AID KIT EQUIPMENT CARD OR LOSE TOUR NEXT TURN.
QUIZ CARD
IT IS 130°. YOU NEED TO GET OUT OF THE SUN. USE YOUR JACK KNIFE TO MAKE SHELTER OR LOSE YOUR NEXT TURN.
110° TODAY!! LOSING TOO MUCH WATER THROUGH YOUR PERSPIRATION. USE THE LOW-SLUNG SHIRT EQUIPMENT CARD OR LOSE YOUR NEXT TURN.
IT IS 112° NOW! YOU DECIDED TO TAKE SALT PILLS WITH REFRIGERATED YOUR BODY. LOSE YOUR NEXT TURN.
QUIZ CARD
YOU FILLED YOUR CANTEEN FROM A BLUE COOL STREAM. NOW YOU ARE SICK. USE WATER PURIFICATION KIT EQUIPMENT CARD OR LOSE YOUR NEXT TURN.
YOU TRIED TO CROSS A DRY STREAM. LOSE ALL EQUIPMENT CARDS.
THE FINISH!
BROWN EQUIPMENT CARD
QUIZ CARD
YELLOW EQUIPMENT CARD
QUIZ CARD
THE DESERT ADVENTURE GAME
1
2
3

Gameboard

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